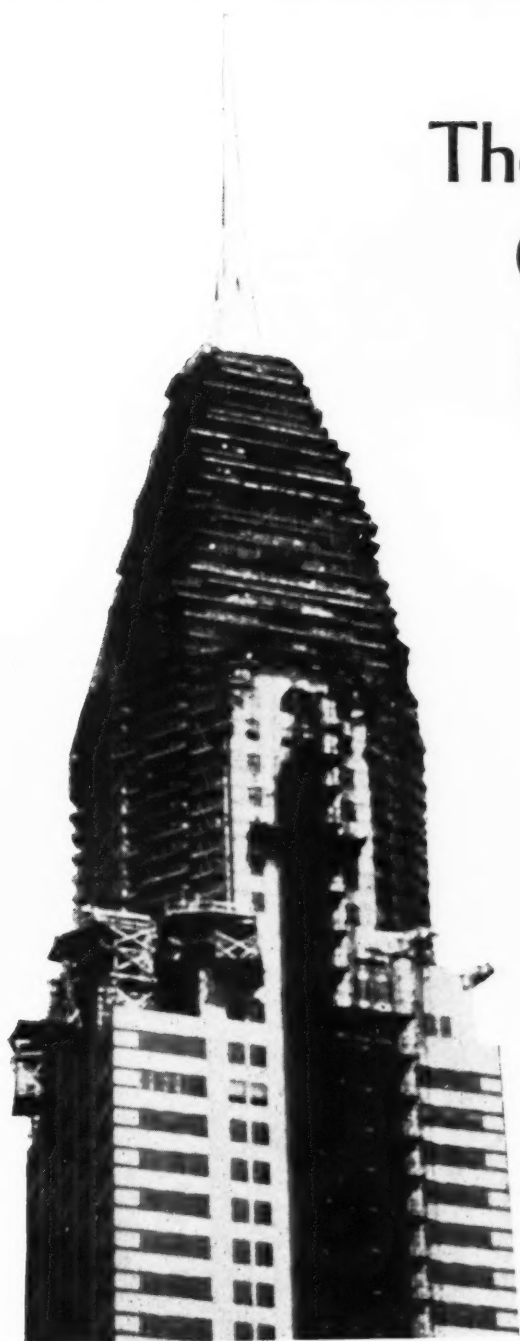


# American Artisan

THE WARM AIR HEATING  
AND SHEET METAL JOURNAL  
FOUNDED 1880



## The CHRYSLER BUILDING

The year's most interesting job in sheet metal work. The first part of a complete story on the details of the job.

JUNE 7, 1930



# The BIG Success Idea

is a positive,  
proved method  
for increasing  
your warm air  
heating sales

Write Today for This  
Big Free Book—

It contains the complete sales  
plan. It shows you the 8 Big  
Mailing Pieces we send to your  
prospects.

# SUCCESS



TWO years ago we made a thorough analysis of the warm air heating business from the consumer sales angle.

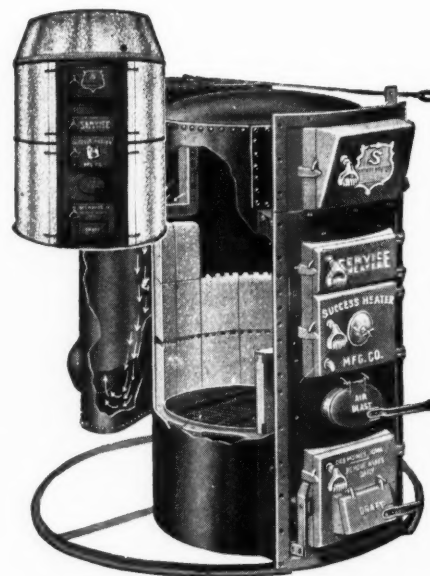
Our investigation showed us that the dealer—*you*—needed more merchandising, sales and advertising assistance than any manufacturer was offering the trade.

"The Big Success Idea" is the outcome of that investigation. It has proved its worth beyond expectations. Success dealers demand its continuance because they say it is just what they need.

Many dealers, already knowing of the quality and superior features of the Success Heater line, immediately took on the Success agency after looking over this sales plan.

The mailing pieces used in this sale plan not only sell the prospect on the Success Heater, but on the superiority of *Warm Air Heating* and on *your ability as a reliable heating contractor*. Get the Big Success Idea and you will get more business.

Success Heater Manufacturing Co.  
Des Moines, Iowa



# HEATERS

June

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**T. E. HENRY**  
Chairman of the Board  
The Henry Furnace & Foundry Co.

## The Men behind **MONCRIEF FURNACES**

Specialization is supposed to be the recently discovered formula for success. T. E. Henry realized the value of specialization back in 1891. He became interested in the manufacture of furnaces that year, and has been at it ever since.

In 1896, he began the making of furnaces on his own account. That first year, the product of his foundry was 23 furnaces. The quantity was not great, but the quality was as high as could be attained at that time.

From that small beginning the sales steadily grew, and soon a new foundry had to be built, devoted solely to the manufacture of furnaces. At the present time, the company is turning out considerably more furnaces than at any previous time in its history.

Mr. Henry is exceedingly modest about his part in building this successful business. It has principally been a matter of knowing exact costs and basing one's operations on accurate figures. Anyone can achieve success if he will only do this, Mr. Henry believes, and will never get anywhere if he does not.

During all these years Mr. Henry has been dili-

gently on the job as head of the company. In February of this year, he resigned as President to become Chairman of the Board. In this capacity his long experience is of real value in the conduct of the business.

Moncrief Furnaces have well earned a fine reputation for efficiency, quality and economy. They are the product of long experience and the most up-to-date findings in heating engineering.

The owner of a Moncrief Furnace enjoys every advantage that warm air heating affords. The Moncrief Furnace dealer can show a line second to none, presenting everything demanded in modern house heating.

The details of the Moncrief proposition will interest every progressive furnace dealer.



*We supply everything used on  
a warm air heating job*

**THE SERIES  
"C"**

**THE HENRY FURNACE & FOUNDRY CO.**  
3471 EAST 49th STREET  
CLEVELAND, OHIO

**THE SERIES "C"  
CAST FURNACES**

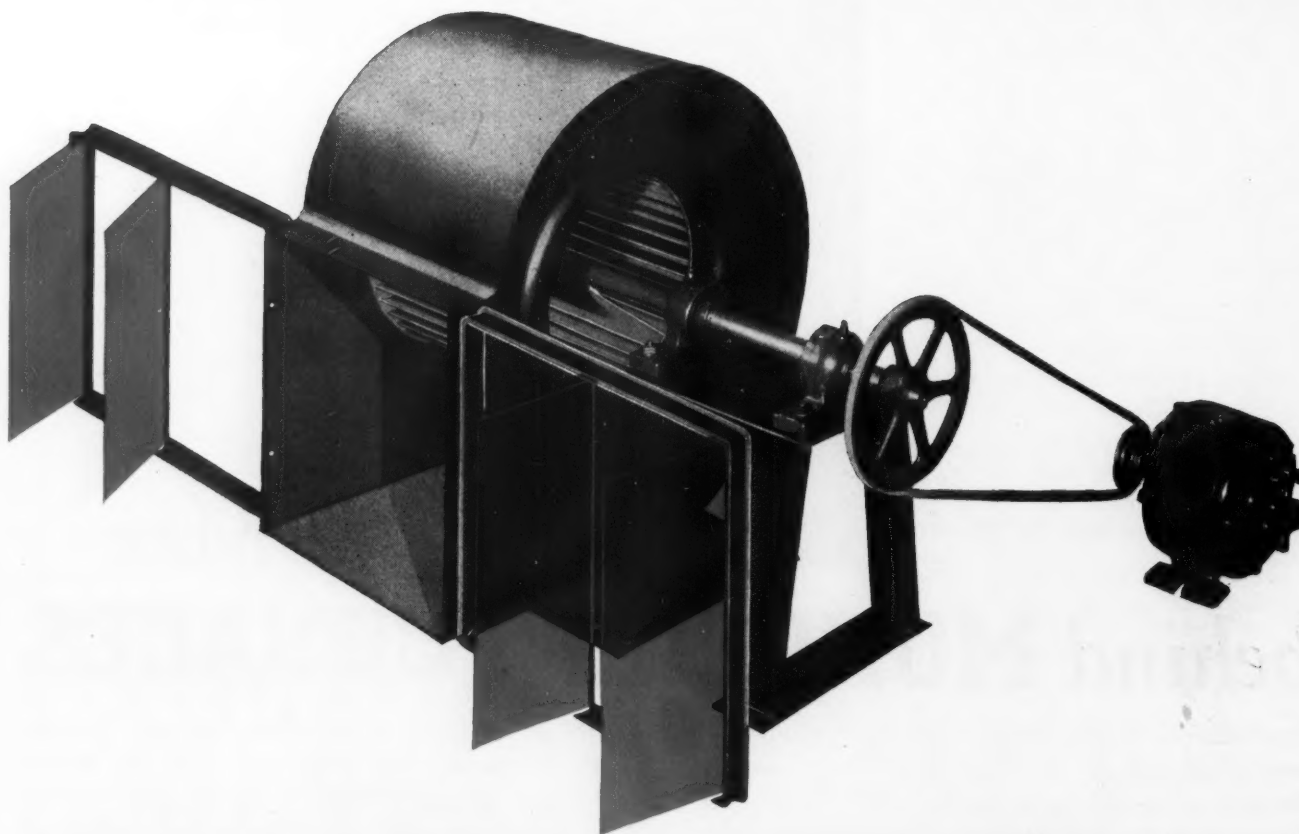
**THE NEW MONCRIEF  
STEEL FURNACE**

Published Every Other Week by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, January 29, 1930, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

INDEX PAGES—14 and 56

[VOL. 99, NO. 12—\$2.00 PER YEAR]

BUYERS' DIRECTORY—52 and 54



## The Miles Centrifugal Blower with by-pass louvers

**T**HE fact that the entire warm air furnace industry is thinking in terms of *air conditioning* today, rather than in terms of merely heating, indicates the tremendous advance that the industry has made within the last four years.

That there is a growing appreciation of this trend on the part of the public is evidenced by the *better type* of jobs which the warm air heating specialist is today being asked to figure on.

The owners and builders of more elaborate homes who formerly considered only radiator systems, are now seriously interested in *air conditioning*.

The time therefore has arrived for the announcement of the Miles Centrifugal Blower to take care of these jobs, especially where delivery of air is wanted against *static pressure* resistance. The Miles Blower is equipped with squirrel cage centrifugal type wheel. It is scientifically designed at every point and scientifically constructed for delivering air *against specific resistance*.

The Miles Centrifugal Blower is the only blower designed strictly for direct heat transmission and is the dependable product of wide research work and broad experience in actual practical application of fan systems.

### Why the by-pass louvers?

The merits of the Miles patented *by-pass louvers* have been so significantly demonstrated in thousands of jobs that it is almost unnecessary to explain them; their necessity is apparently so obvious. Yet, despite this general appreciation, there is occasionally someone who fails to

grasp the vital importance of the *by-pass louvers* in connection with successful blower systems for domestic use.

Engineers will at once recognize the positive necessity for *by-pass louvers*. Those who have installed forced air jobs will be equally clear and

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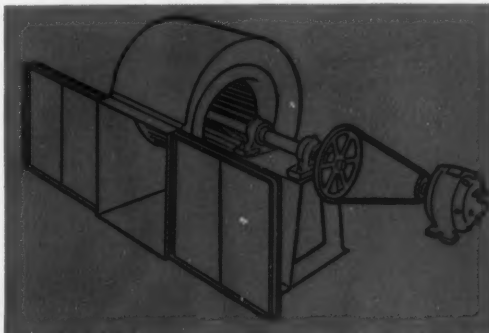
Mention AMERICAN ARTISAN in your reply—Thank you!

certain about their necessity. But, for the benefit of those not yet familiar with this important principle in domestic forced air heating or air conditioning, may we say that this principle developed itself *out of necessity*. The by-pass louvers on either side of the fan orifice of the Miles Centrifugal Blower provide FREE AREA for GRAVITY flow when the fan is not running. And this ex-

clusive advantage is necessary for successful operation of any proper air conditioning service because: (1) It positively protects the heater from damage due to careless operation, abuse or other unavoidable causes. (2) It allows the air to circulate for GRAVITY heating service without any impediment.

### But Why the Necessity for GRAVITY Flow?

The reason that it is necessary to have gravity flow available is that there is such a wide range in winter temperature. A wide range in winter temperature bespeaks the necessity for a wide range in heating capacity in a single unit. A heating unit must not only be able to deliver a peak load to meet maximum severe conditions, but it must also be able to meet the other extreme. Thus, of necessity the straight blast system becomes an on-and-off



system. With ability to return instantly from straight blast to gravity gained through the use of the Miles by-pass louvers, you get an amazing versatility and flexibility. Instant return to gravity *reduces the capacity* of the heating unit to corre-

spond with the heating requirement of the season . . . and gravity will hold the temperature for an extended period even in very cold weather.

### Miles Blower meets with enthusiastic reception

Before making this formal announcement to the trade, we had already advised many in the trade of the forthcoming Miles Blower.

The enthusiastic response was instant. Letters poured in from the most substantial groups in the trade expressing appreciation of this unit and congratulating us on what we had already contributed to the health and advancement of the furnace industry through our consistent pioneering of FORCED AIR and AIR CONDITIONING. And they said it with orders, too! Not just *samples*, though we are glad to ship sample orders—but orders for quantities. It has been one of the most gratifying experiences we have had in this wonderful business.

The mails continue to bring in evidence of this splendid confidence which is founded upon the fact that everybody knows we are offering a *scientific job*—scientific in *design*—and scientific

in *construction*.

Note this blower has DOUBLE inlet; DOUBLE width fan unit, with LOW tip speed, LOW outlet velocity for quiet operation and WIDE HORIZONTAL discharge opening for even distribution through heater.

COMPLETE LINE OF SIZES and an infinite variety of speeds to meet every condition.

The MILES BLOWER opens up to you a still greater opportunity in the sale of air conditioning systems. It means that you have at your service a dependable BLOWER with the automatic by-pass louver principle . . . a quiet, QUIET operation and assurance of complete satisfaction . . . with REAL PROFITS. Don't wait until your neighbor gets the first sample . . . get it yourself—exhibit it . . . make money from it while he is still hesitating. Our engineering department is always at your service for making correct layouts.

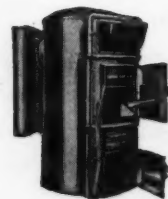
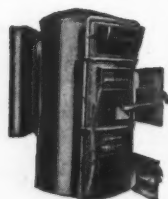
# The Miles Blower

THE WARM AIR FURNACE FAN COMPANY

6511 CEDAR AVENUE, CLEVELAND, OHIO

Mention AMERICAN ARTISAN in your reply—Thank you!





# The high quality that's made Western famous permeates every Western Steel Furnace

*Write for Information*

## WESTERN STEEL PRODUCTS CO.

130 Commonwealth Ave.

Duluth, Minn.

### Group One

Pittsburgh, Pa. — Pittsburgh  
Furnace Parts Company  
Ravenna, Ohio — Ravenna  
Furnace Company  
Cincinnati, Ohio — Niehaus  
Furnace Repair Company  
Atlanta, Ga. — Moncrief Fur-  
nace Company  
Chicago, Ill. — Western Steel  
Products Company

### Group Two

St. Louis, Mo. — MacRoy Supply Co.  
Kansas City, Mo. — Kansas City Furnace Co.  
Duluth, Minnesota — Marshall-Wells Co.  
Omaha, Nebraska — A. Y. McDonald Mfg.  
Co.  
Lincoln, Nebraska — A. Y. McDonald Mfg.  
Co.  
Sioux City, Iowa — A. Y. McDonald Mfg.  
Co.  
Minneapolis, Minn. — A. Y. McDonald Mfg.  
Co.  
Fort Dodge, Iowa — Leighton Supply Co.  
Fargo, N. D. — Fargo Cornice & Ornament  
Co.

### Group Three

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Furnace & Equipment Co.  
San Francisco, Cal. — Pacific  
Sheet Metal & Furnace Co.  
Winnipeg, Man. — Marshall-  
Wells Co.  
Saskatoon, Sask. — Wood-  
Vallance Co., Ltd.  
Regina, Sask. — Wood-Va-  
llance Co., Ltd.  
Edmonton, Altna. — Marshall-  
Wells Alberta Co., Ltd.

Mention *AMERICAN ARTISAN* in your reply—Thank you!



# Guaranteed Permanently Gas-Tight

## Guarantee

We, the manufacturers of the Waterbury Seamless Furnace, do hereby fully guarantee same, when installed according to the provisions of the Standard Code, as follows:

1. That it shall be absolutely gas-tight.
2. To replace, free of charge, F.O.B. factory, upon its return to factory, any steel part of a Waterbury Seamless Furnace body or radiator, if it gives out within TEN YEARS after date of purchase.
3. The only conditions to this guarantee are that the date of purchase be definitely shown, that the heater be properly used, and was installed within its rated capacity as determined by the Standard Code.

THE WATERMAN-WATERBURY COMPANY.



**P**EOPLE today are buying comfort and health—not just heat. They don't want coal-gas, smoke, soot or ash-dust in the air they breathe. They want a heating system that is absolutely gas-tight.

The Waterbury is the **ONLY** furnace guaranteed **PERMANENTLY** gas-tight. Both body and radiator are one-piece, steel construction, with every seam welded. No joints to crack and leak—no rivets to work loose—no calking to spread.

You can get your price and make a good profit on the Waterbury because you have an exclusive proposition that the public wants.

The Waterbury Merchandising Sales Service helps you turn prospects into customers. It is part of the Waterbury Franchise. Send coupon below for complete information.

**Mail This  
Coupon  
NOW!**

## The Waterman-Waterbury Co.

1122 Jackson St. N. E. Minneapolis, Minnesota

Complete Stock Carried in

PHILADELPHIA DENVER TACOMA  
KANSAS CITY CHICAGO PITTSBURGH  
SAN FRANCISCO

The Waterman-Waterbury Co.  
1122 Jackson St. N. E.,  
Minneapolis, Minnesota

Please send complete details of the  
Waterbury Franchise and Merchandising  
Sales Service.

NAME.....

ADDRESS.....

CITY..... STATE.....

Mention *AMERICAN ARTISAN* in your reply—Thank you!

You CAN get the BIG  
PROFITS in warm air  
heating with the  
FARRIS WATERBASE  
FURNACE



With this  
furnace  
you can  
assure your  
customers  
35 to 55%  
relative  
humidity

It provides modern warm air  
heating---air conditioning

**T**HE Farris Patented Waterbase is unusual and as practical and simple as it is out-of-the-ordinary.

Thousands of home owners are enjoying *real* humidified warm air heat with the Farris Waterbase Furnace.

With its automatic regulation, draining and flushing features it is highly successful.

With the Farris the usual and greatest source of dust leakage is eliminated.

It acts as an air cleaner as well as a humidifier and it is absolutely fool proof providing unusual convenience as well as assurance of steady, even humidification.

Have us tell you how this and other Farris features enable you to get the BIG PROFITS.



Just send the coupon today

**FARRIS FURNACE CO.**

Established 1899

SPRINGFIELD

ILLINOIS

FARRIS FURNACE CO., SPRINGFIELD, ILL.

Send me full details and dealers' proposition on the Farris Waterbase.

Name.....

Address.....

City..... State..... A.A.



## SMOKELESS Operation

**I**F the Ath-A-Nor had only the Three-Way Air Blast (which is an exclusive feature) to recommend it, it would still be an outstanding quality furnace because this feature produces smokeless, economical and efficient heating. However it has many other features and it is high quality in every respect. Have us send you the complete details now.

Besides the Ath-A-Nor the May-Fieberger line includes several styles and a complete range of sizes in both cast iron and steel furnaces. Every May-Fieberger furnace is high grade and reasonably priced.

**The May-Fieberger Co.**  
Newark, Ohio

Mention AMERICAN ARTISAN in your reply—Thank you!

# REX

## Gas Furnaces

THE REX GAS FURNACE is a product of our 37 years of research and experience in the manufacture of Gas Fired Furnaces and Units.

This new improved REX for either forced or gravity is a surface combustion, tubular furnace designed and constructed to burn gas economically and efficiently.

They produce their intense heat from the sides and tubes in the Unit, the air passes through the tubes and is highly heated, white

arrows show the long detour in fire travel of the burned gas to the flue.

People demand greater comfort, more convenience, less drudgery and cleaner heat, REX GAS FURNACE is the solution.

You furnace dealers who do or do not sell Gas-fired warm air furnaces, now is the opportune time to get in line and receive your share of this immense business that is sweeping the country by leaps and bounds.

*Write today for literature and prices, don't delay as this spells better business, increased sales and more money.*

### CALKINS & PEARCE

203-05 EAST LONG STREET

COLUMBUS, OHIO

*Manufacturers of Rex Gas Furnaces, Gas Attachments, Gas Furnace Units, Factory and Garage Heaters*



*Broken View of No. 290 Gas Furnace*

You can sell  
GAS HEATING  
to OLD as well  
as new customers

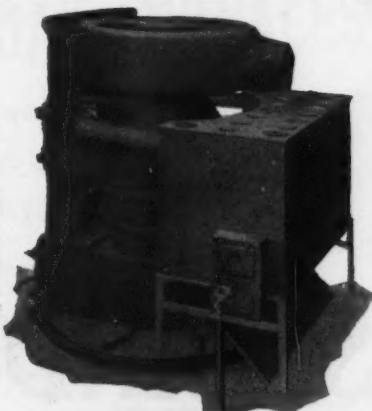
with  
The MUNKEL GAS  
ATTACHMENT

It fits any coal furnace—it heats both units giving extra large radiating surface. Simple, efficient, economical and easy to install. Stimulate business and make more profits with the Munkel Gas Attachment.

*Write today for full details*

The MUNKEL-RIPPEL  
HEATING CO.

"31 Years of Service"  
Columbus, Ohio



### An Emblem of Quality

The dealer who has never sold Torrid Zone steel furnaces has no conception of the many advantages this furnace line offers. To say you are familiar with Torrid Zone construction is not enough. There are, free engineering service, newspaper and dealer help advertising, financial aid, an unusual va-

riety of furnace sizes, quick deliveries made possible by large warehouse stocks, and a score of other Torrid Zone service features of vital interest to every furnace dealer. Why not investigate for yourself Torrid Zone possibilities. Write for complete information on the Torrid Zone line.

LENNOX FURNACE COMPANY, INC.

Marshalltown, Iowa    Syracuse, N. Y.    Toronto    Winnipeg

## BRILLION FURNACES

*Will enlarge your margin of profit*



YOUR selling problems can be solved with the Brillion. It has the quality, weight, heating efficiency features and convenience design that folks want.

Its appeal gives you the edge in meeting competition and its price gives you a better profit.

Our conservative sales plan, low overhead and absence of high priced non-productive executives enables us to build this better furnace at a low price—send the coupon for full details.

BRILLION FURNACE CO., 3715 Elston Ave., Chicago.  
200-300 Park Ave., Brillion, Wis.

Send me full details and Catalog No. 80.

Name.....

Address.....

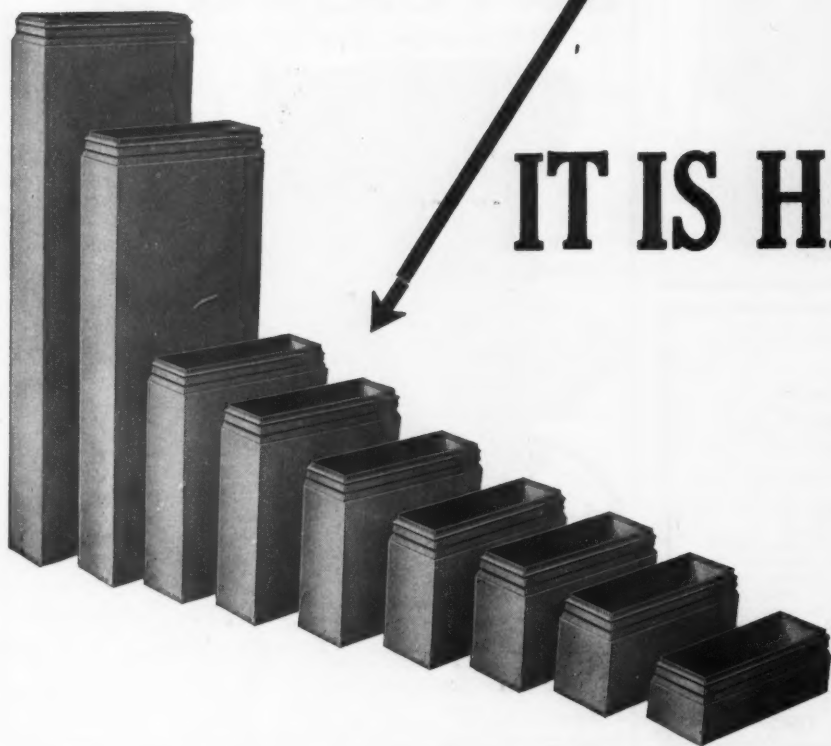
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# A POINTER on HANDY PIPE

*It Is Built to Outlast the  
Buildings It Goes Into*

We started out, in 1894, to  
make HANDY pipe the very  
BEST pipe to be had—and  
we've never switched from that  
objective.



**IT IS HANDY** BY NAME  
TO USE  
TO GET

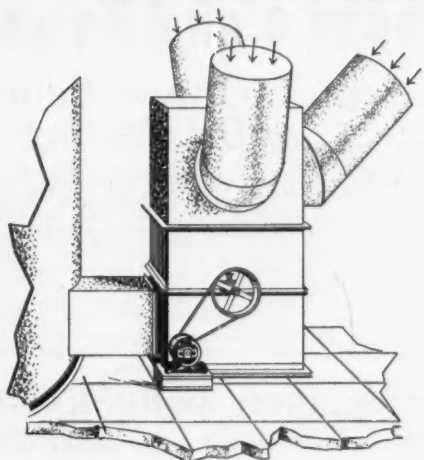
**F. MEYER  
&  
BRO. CO.**

Peoria Illinois

*"The Handy Pipe People"*

*Mention AMERICAN ARTISAN in your reply—Thank you!*



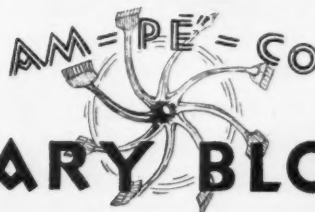


*Air can enter at top, rear or bottom because of special design.*

The air chamber in back of scroll or blower housing is an exclusive feature. This design allows unrestricted entry of free air from top, sides and bottom of inlets and provides increased and better distribution of air. It increases capacity of blower.

To positively move the air---  
To be sure of uniform air  
delivery to all rooms---  
To make better profits---

USE THE



## ROTARY BLOWER

**T**HIS blower was designed for use exclusively on warm air heating systems. It furnishes efficient mechanical circulation and is practically noiseless.

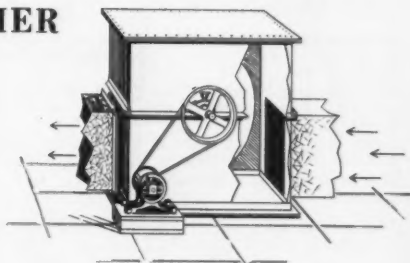
### SELL IT FOR COOLING HOMES THIS SUMMER

Cooling the home with the Am-Pe-Co is a fact—this positive blower enables you to guarantee **REAL** air circulation—enables you to get extra business and profits right now.

The Am-Pe-Co is Silent—almost noiseless—and perfect in construction, being made by a Company thoroughly experienced in making precision products.

*Write today for full details and prices.*

**AMERICAN MACHINE PRODUCTS COMPANY**  
MARSHALLTOWN, IOWA



## ROUND OAK FURNACES

Other Dealers Are Selling  
Them at a Good Profit—  
Why Not You?

*Write or wire for full details*

**THE BECKWITH COMPANY**  
Dowagiac, Michigan



## GILTEDGE guaranteed FURNACES

**F**OR fifty-five years the name GiltEdge has meant high quality furnaces. Today more than ever before GiltEdge Furnaces lead as to quality and workmanship.

The GiltEdge agency will add extra prestige and profits to your business.

*Write today for full details regarding the GiltEdge 1930 sales plan.*

**R. J. SCHWAB & SONS CO.**  
283 Clinton Street Milwaukee, Wis.



Try One  
For Three Days  
**FREE**

*Our one-man outfit makes low overhead*

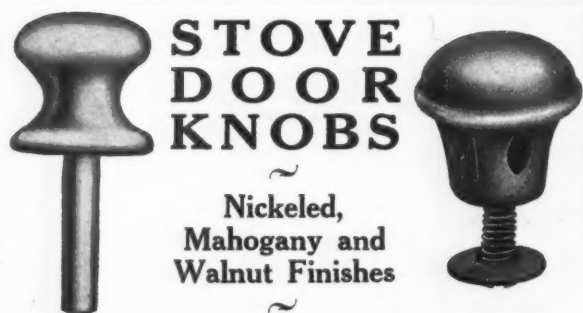
**R**EPORTS from Super Suction owners bring out these big facts: nearly three-quarters of all furnaces cleaned buy repairs—many order complete overhauling—prospects for new furnaces are constantly turned up—and sold.

For every worker out cleaning furnaces four shopmen are kept busy on the new business created. What would that mean for your own shop?

*You can have a Super Suction Cleaner for three days' free trial. Can you afford to pass up this big opportunity? Write today.*

**THE NATIONAL SUPER SERVICE CO.**  
1944 North 13th Street Toledo, Ohio

*Mention AMERICAN ARTISAN in your reply—Thank you!*



## STOVE DOOR KNOBS

Nickeled,  
Mahogany and  
Walnut Finishes

We Have a Great Variety of Shapes and Sizes

Write Dept. F for Samples and Prices

THE FANNER MFG. CO. BROOKSIDE PARK, CLEVELAND, OHIO

A  
New  
Furnace  
Paste

**(LARCO  
MINERAL  
PASTE)**

Non-Cereal  
Non-Souring  
Keeps after  
Mixed

### For Better, Neater, Quicker Work

Asbestos Paper does not absorb as much Larco Mineral Paste as it does cereal pastes. Paper does not become soggy—not so apt to tear.

Larco Mineral Paste does not turn brown—no stains—mice will not touch it either when moist or dry and it does not gum up the hands.

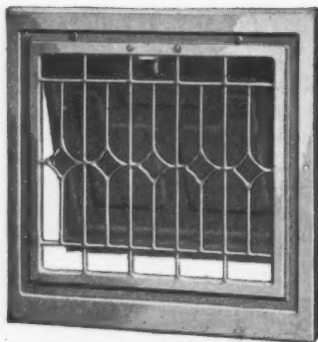
Larco Paste can be kept on hand mixed ready for use as it does not sour. It has greater covering qualities.

It slips easily but adheres permanently.

Write for circular which tells all about it—get Larco prices.

LARSEN-BENNETT COMPANY  
Omaha, Nebraska

## INDEPENDENT REGISTERS

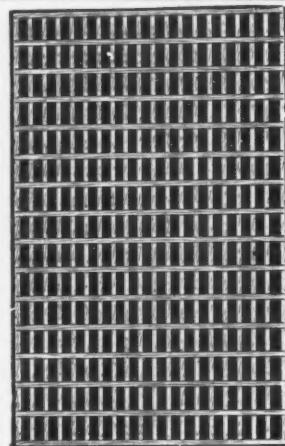


VENTILATORS  
GRILLES

Any Size  
Any Finish

Our new catalogue  
will interest you.  
May we send you  
a copy?

INDEPENDENT REGISTER & MFG. CO.  
3747 East 93rd Street ~ ~ Cleveland, Ohio



## AMERICAN WOOD REGISTERS

WHEN you order wood registers  
be sure of getting the best by  
buying these famous wood faces—

Known as the finest  
for over 21 years

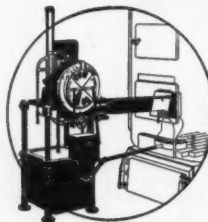
They add extra value without extra  
cost. We make nothing but  
Wood Registers and only the best.

Write today for catalog  
and latest price list.

The AMERICAN WOOD  
REGISTER CO.  
Plymouth Indiana

## Balanced Heat

### The McIlvaine Method of Oil Heating



Listed as Standard by  
Underwriters

Approved by New York  
Board of Standards and  
Appeals

With the fidelity of a well-balanced scale, the amount of heat supplied by the McIlvaine Method automatically increases or decreases exactly as the temperature outside demands. Thus, an even temperature is maintained indoors, all winter long. The McIlvaine Continuous Flame Oil Burner (recommended by the leading warm air heating experts) with its five flame sizes, automatically balanced to the heat demand, gives positively satisfactory results, and is highly efficient when installed in warm air and other types of residence heating systems.

WRITE NOW  
for dealer's proposition, sales plan and complete information.

McILVAINE BURNER CORPORATION  
747 Custer Avenue Dept. A Evanston, Ill.

### For WARM AIR and HOT WATER combination jobs

Three  
Sizes  
Connected

USE **ALAMO**  
WATER HEATERS



Write today for descriptive cir-  
culars on the complete line

Made in 11 sizes and designed so  
that several can be connected to  
give desired capacity for heating  
one to ten rooms with hot water  
radiators.

Made to fit all types of warm air  
furnaces. Installed in center of  
furnace above fire—they do not in-  
terfere with firing or efficiency of  
furnace. Heat the distant rooms—  
make extra profits with the ALAMO  
LINE.

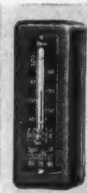
**ALAMO HEATER COMPANY**

6143 Wentworth Avenue

Chicago, Illinois

## only \$48 installed

All Electric—plus 4 Exclusive Features



- 1 Automatically checks furnace in event of electrical current break.
- 2 Automatically re-engages after fueling.
- 3 Gradual operation of draft and damper. No hanking up of gas or smoke.
- 4 No weights, electric motor, clock or dry batteries—nothing to oil.

Simple to install. Thousands are in use. Listed as standard by Underwriter's Laboratories.

**SHEER COMFORT**  
heat Regulator

Ask your jobber or write

H. M. Sheer Co., 213 Hampshire St., Quincy, Illinois

Dealer Price  
\$22.75  
f.o.b. Quincy, Ill.



### It settles the dust in the ashpit

## FURNACE DUST ELIMINATOR



MAKES removing ashes a clean, easy  
job and that's why you can make  
good profits selling it. Every furnace  
user will appreciate this new Patented  
feature of your installations.

It means more furnace jobs and  
pleased customers.

It sprays a fine moisture over the  
ashes and keeps dust from spreading.  
Saves grates, adds to furnace efficiency  
and is easily attached. The sleeve con-  
nection allows the nozzle to swing out  
of the way with door. High grade in  
all respects.

Write today for full details, circular and prices

**DUSTLESS ASH COMPANY**  
MUSKEGON, MICHIGAN

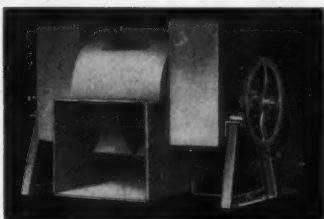
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## Furblo The Furnace Blower Everyone Recommends

MANUFACTURERS have adopted FURBLO as standard equipment—jobbers catalog FURBLO exclusively—dealers everywhere find FURBLO the one and only satisfactory solution to the problem of mechanical warm air heating.

FURBLO is not a fan—but a blower. Quiet, efficient, powerful, sturdy, dependable. Guaranteed to always produce on even the hardest job.



**Lakeside Company**  
Dept. A6 Hermansville, Mich.

Two sizes fit practically all installations. Send for complete information.  
Makers of Lakeside Ventilating Equipment

## "American Seal"

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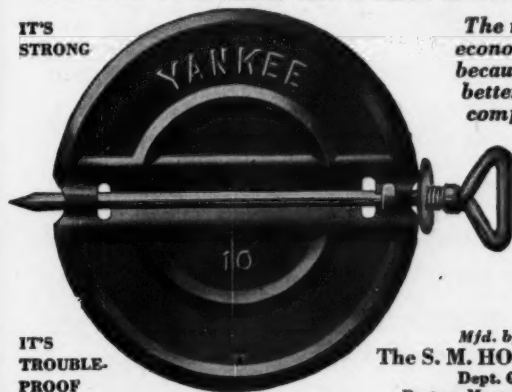
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# American Artisan

THE WARM AIR HEATING  
AND SHEET METAL JOURNAL

Entered as second class matter, January 29, 1930, at the Post Office at Chicago, Ill., under act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

Yearly Subscription  
Price:

United States ..... \$2.00  
Canada ..... \$3.00  
Foreign ..... \$4.00

Published EVERY OTHER SATURDAY—to Promote Better Warm Air Heating and Sheet Metal Work

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## PORTER-SPOFFORD-LANGTRY CORPORATION

139 North Clark Street, Chicago—Telephone Central 7670

Fred D. Porter, President      John C. Langtry, Vice-President      Howard H. Bede, Secretary  
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Frank G. Cambria, Eastern Representative

Vol. 99, No. 12

CHICAGO, JUNE 7, 1930

\$2.00 Per Year

## Table of Contents

	Page		Page
Sheet Metal Is Looking Up.....	17	Some New Ideas On That Floor	
<i>An editorial.</i>		Draft Problem.....	32
Cost Accounting.....	18	<i>G. A. Voorhees of Indianapolis, a recognized heating engineer, brings out some ideas in regard to that floor draft problem that should benefit every heating man.</i>	
<i>The fifth article in the series on Bookkeeping and Cost Accounting by J. G. Dingle. This article tells all about the items which you should figure in your overhead.</i>		Correcting a 15-Year-Old Cornice	
The Chrysler Building.....	20	Error.....	35
<i>The first part of a complete discussion of this interesting job which is undoubtedly the year's most outstanding job in sheet metal.</i>		<i>The story of a job in cornice work done in Kansas City. This work is an unusually good example of how faulty cornice work can be repaired at a profit by a little salesmanship.</i>	
He Who Hesitates Is Lost.....	25	An Unusual Two-Way Y.....	36
<i>A. E. Munkle of Columbus, Ohio, gives some pointers on selling which he has discovered from 31 years of selling warm air heating.</i>		<i>L. F. Hyatt, contributing editor, works out a pattern for an intricate two-way Y which had stumped a reader.</i>	
Two Furnaces With a Fan Replace		An Air Control System For a Candy	
Eight on Gravity.....	26	Plant.....	38
<i>Details and pictures of an unusual heating installation in which two furnaces with a fan replace eight furnaces without a fan.</i>		<i>Charlie Rundell, of Ft. Wayne, Ind., did this interesting piece of duct work. The job is typical of the work done by contractors operating in the industrial field. You may get some ideas from this story.</i>	
Development of a Special Elbow.....	28	A Solution to the Window Sweating	
<i>W. R. Haines, our contributing editor, lays out a difficult elbow which was requested by one of our readers.</i>		Problem.....	44
The Coal-Furnace Conference.....	29	<i>That window sweating problem we have been discussing brings in an excellent solution from Ed. Kunold of Aurora, Ill. See what you think of Ed's way of removing the trouble.</i>	
<i>A report of the meeting between coal dealers and operators and distributors and representatives from the warm air heating industry. Some of the things discussed are of vital importance to every one of our readers.</i>		Notes and Queries.....	46
		Association Activities.....	47
		New Items and News Items.....	48



# Another— —Important “AFCO” Announcement!

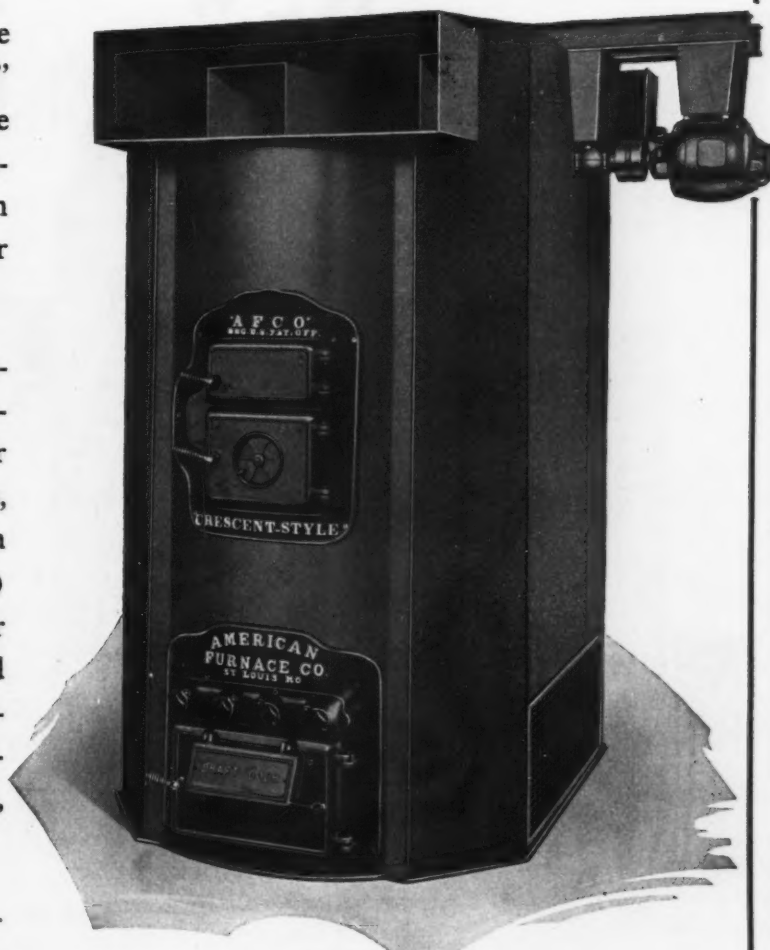
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# American Artisan

THE WARM AIR HEATING  
AND SHEET METAL JOURNAL



Vol. 99

CHICAGO, JUNE 7, 1930

No. 12

## Sheet Metal Is Looking Up

If you don't believe it just drop into the office of some of your architectural friends and get them talking about sheet metal. Of course you will have to pick your architect. Some architects, like some sheet metal contractors, are still all wrapped up in new surreys and snaffles.

The architectural papers have been full of sheet metal jobs for months. And your trade papers, too, have given you stories on big sheet metal jobs, the like of which the building industry has never seen before.

Why has all this come about?

First there is the factor of promotion. Copper and Brass Research Institute has been working on the architects for years. They have been so successful that nowadays an architect designing a quality residence thinks of copper and lead coated copper or perhaps lead itself, just as soon as he gets the general outline down on the board.

The zinc folks are now getting into the field again and no doubt will soon be showing architects what wonderful designs and beautiful effects can be had from zinc.

If you want to know what has been done with aluminum just look back to the May 24th issue of the ARTISAN and read about that aluminum roof job. We are going to tell you about a couple more such jobs before long.

In this issue there is the story of the Chrysler building. We called that job a sheet metal man's dream come true. That sounds pretty romantic for a trade paper, but the job is just that and no less. Don't imagine for a minute that once the architects of the country get a good chance to look it over and study it that stainless steel is going to sink out of sight.

The architects are becoming sheet metal conscious.

A real job of selling is being done by the manufacturers of these sheet metals. They are making the architects aware of this old established trade and are giving the architects such metals as literally drag him to his drafting board to see what he can do with them.

But aside from the mere beauties of sheet metal

there is a second factor which is making itself felt. That is the weight problem. What do you imagine the tower and spire of the Chrysler building would weigh if it were made say, of terra cotta or concrete or slate or stone? Why that structural frame would have to be made heavier all through the tower, and below the tower stronger to carry the heavier tower and so on right down to bed rock.

As these great buildings shoot higher and higher, weight is bound to play a more and more important part. But this matter of weight effects the six and twelve and twenty story building as well.

A third factor which is working for our industry is the collective effect of the work we are doing ourselves. Just what do you suppose the architects who get one of the books "Standard Practice in Sheet Metal Work" think when they look through its pages? In 90 cases out of a hundred they are astounded. They had forgotten or never knew that such beautiful work could be made out of sheet metal.

Architects generally are today in a period of unrest and change. They are in the mood to try something different. They have been playing with stone, terra cotta, slate, etc., so long they are really anxious to try their hands in some new or renewed craftsmanship.

That feeling plays right into our hands.

The situation as we see it, is just primed for action. What we need is enough concerted action out of the contractors themselves to sell sheet metal to the architects. Most contractors are calling on architects, but are not selling a blessed thing.

You are taking what you get and not doing a thing to push conditions to a climax. Our associations ought to appoint committees whose duty it shall be to call on architects and interest them in sheet metal and the sheet metal book. We ought to circularize the architects with articles giving the details of the big sheet metal jobs going around the country. Or take your copy of your magazine along with you when you call on the architect and show him what is going on in your field. Every small effort added to what has gone before and what is coming after will serve to move the inertia just that much faster. If we all pull we will get somewhere.



# The Fifth Article On Cost Accounting

**W**E have covered, in previous articles, several of the major activities of the Warm Furnace Installer's business. Our last article was based upon Work In Process account, which, in the writer's opinion, is one of the most important accounts in the entire chart of accounts. This article will deal with those accounts which come under the general heading of OVERHEAD ACCOUNTS.

In order that you may thoroughly grasp the difference between the Work In Process account and these Overhead Accounts, we call your attention to a few very plain facts.

1st. Reference to Article IV will bring out the fact that you charged to the Smith Job—in Work in Process account—certain specific things. You charged that job with a furnace and other items of materials. You charged the labor that Arnold Gerding put in on that job. These are definite and direct charges.

2nd. While that Smith Job was in progress, many indirect expenses were being incurred. That Job should carry its proper proportion of the shop rent, telephone, bookkeeper's salary and other indirect expenses. These expenses are INDIRECT in that we cannot definitely determine just how much of each can be charged to the Smith Job. We can apply them only as an indirect charge—in total—after knowing our previous experience. In other words, if these expenses have amounted to a certain figure in past years, we must assume that they will amount to approximately that total this year. By the same reasoning, we know our



Joseph G. Dingle, C. P. A.

volume of direct material and labor for prior years. We also know from past experience our sales volume. If last year's sales were \$10,000.00 and last year's indirect expenses were \$2,000.00, we know that 20c out of each customer's dollar went to pay our indirect expenses. Using this as a basis, we can estimate the portion of our indirect expenses applicable to each sale.

Let us now look over our shop and determine just what indirect expenses we have. If each shop uses the same expense classification, great good will come from the ease of comparison of operating results. We will find the following accounts will fit practically every shop:

Advertising; Bad Debts; Collection Expense; Dues and Subscriptions; Discount Allowed; Freight and Drayage; Heat, Light and Water; Gas and Oil; Interest Paid; Machine and Tool Expense; Insurance; Office Expense; Rent; Repairs; Selling Expense; Taxes; Telephone and Telegraph; Depre-

ciation; Traveling Expense; Indirect Labor; Returns and Allowances; Delivery Expense.

If you recall our rule for bookkeeping, you can readily use these accounts. If you have paid an advertising bill, you apply the rule—Debit the Disposition and Credit the Source—and you would debit Advertising and credit the Bank. The account name "Advertising" is clearly indicative of what charges, or debits, are to be recorded therein.

Bad Debts account needs no explanation, especially when you find "Collection Expense" account next in the list. In Collection Expense account we will charge any items of expense incurred to effect collection of an account.

Dues and Subscriptions account is to receive charges for association dues and subscriptions to trade journals.

Discount Allowed (by you) is to receive charges whenever you allow a customer to deduct a discount from the amount he owes you EXCEPT when such deduction really amounts to a return of merchandise or a correction of the billed price. Under these circumstances you would use the "Returns and Allowances" account.

Freight and Drayage account is explained in its name.

Gas and Oil Account will cover cost of gasoline and oil used in trucks and automobiles.

Heat, Light and Water. These three kinds of expense are all for the same general purpose—of making your shop usable. Their costs are related and may well be carried in one account.

Interest Paid: This account needs no explanation.



**Machine and Tool Expense:** To cover cost of incidental expense of machinery (but not purchase price) and REPLACEMENT of SMALL TOOLS. Note remarks under Repairs.

**Insurance:** You carry, or should carry, two kinds of insurance, Fire and Workmen's Compensation. Premiums paid to be charged to Insurance account, or, if you prefer, you may use two accounts, Fire Insurance and Compensation Insurance. No Life Insurance premiums should be charged to either of these accounts. A separate account should be set up, or the charge made direct to the personal account of the proprietor.

**Office Expense** should be charged with all items of expense incurred for the operation of the office for which no specific account is used. Printing, stationery, postage, bookkeeper's salary and other expenses of like nature are Office Expense. Telephone costs are chargeable to Telephone and Telegraph, a specific account.

**Rent** needs no explanation. It includes rent paid on shop and garage, if any.

**Repairs** covers repair costs of machinery and equipment, including trucks and automobiles used for business only.

**Selling Expense** is to be charged with all incidental expenses incurred in selling, as also the salary paid salesmen, if any.

**Taxes** account is to be charged with all taxes paid, including license fees and wheel tax charges on trucks and business automobiles.

**Telephone and Telegraph** needs no explanation.

**Traveling Expense** is to cover traveling done for the business—buying trips and convention expense, but if in connection with sales promotion should be charged to Selling Expense.

**Depreciation** is a greatly misunderstood and often misused account. You, of course, realize that

your machinery and equipment wears out from use. You should, therefore, charge off through Depreciation account, each year or month, such an amount as will, during the usable life of the equipment, completely absorb the original cost. To illustrate: Your truck cost \$1,000.00 and you expect it to be usable for five years. You must then charge off through depreciation \$200.00 per year, or \$16.66 per month, in order that your overhead expense may include the wearing out of your truck.

**Indirect Labor:** This account should be charged with all labor costs which cannot be charged else-

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**Too many furnace and sheet metal men figure overhead low because they don't realize all the items which must be included. In this article, Mr. Dingle sets out the items which go to make up overhead. Do you count them all in?**

---

where. If your workmen have idle time, for which you pay them, you cannot charge that against some specific job. Charge it here. Truck Driver will be charged to Delivery Expense, and the bookkeeper will be charged up to Office Expense.

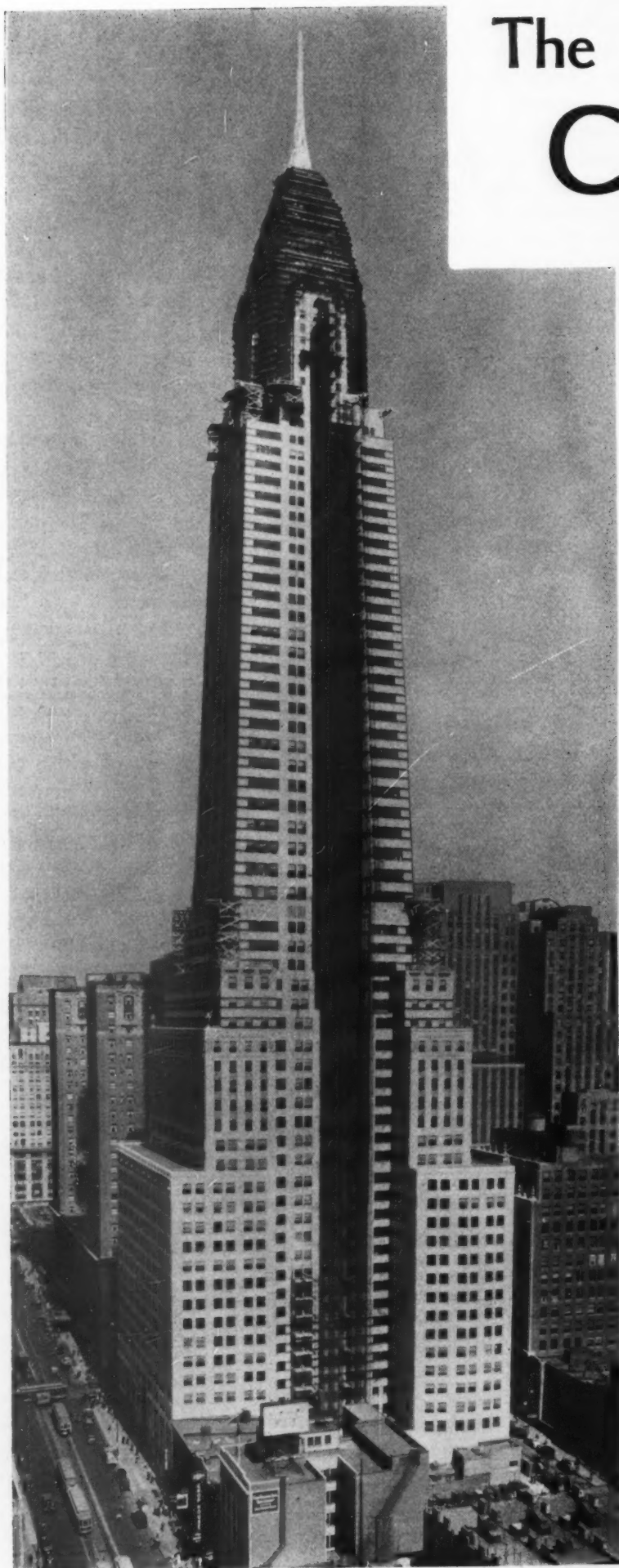
**Returns and Allowances** is to receive all charges affecting adjustments of customer's accounts. For some reason you allow a customer a price reduction. That reduction should be charged here rather than to your Sales account, for the reason that it is an "Allowance" rather than an error in your sales price.

**Delivery Expense** covers all expense incident to deliveries except Gas and Oil and Depreciation, which items are covered by specific accounts. Driver's Salary should be charged here, provided

he is a full time driver. If one of your workmen attends to the driving of the truck to and from the job, his time card will show some time devoted to driver's duties and such time will be charged to delivery expense.

Through the use of these Indirect or Overhead Expense accounts, you will obtain a very good analysis of your expenses. If a large number of individual shops use the same account classification, their operations are more easily comparable. Through such comparisons we can obtain a more accurate idea of the different elements entering into Overhead. When you, as a shop owner, discuss Overhead with one of your fellow-members of the Sheet Metal Contractors Association you are able to talk a common language—Overhead in your office and as you understand it is represented by the same expenses and the same accounts as his. Using percentages taken from your records and from his, you have a common ground for discussion. You have something by which to judge your own efficiency. You and your fellows in your State and National Associations will produce figures concerning OVERHEAD COSTS which will, in time, wake up the more backward members and great good will come to your industry through the elimination of waste in your overhead.

We have thus far covered the necessity for good bookkeeping records, to permit you to keep up with your investment in your business; the means of building up the cost of your work—job by job, and in this article we have given you a list of expense or overhead accounts which will classify your expenses in detail. In our next article we will take up for discussion the Asset and Liability accounts, also the Revenue or Sales accounts. You might review an earlier article wherein the ledger accounts were explained as being racks or bins to hold separate classes of transactions, or information.



# The CHRYSLER BUILDING

## Part I

**I**T would be difficult, indeed, to find any grown man in this country who has not heard of the Chrysler building. It is New York's newest and tallest building—and that means the tallest building in the world. One thousand and forty feet, 77 stories, it towers into the air and on bright days its top can be seen from the farthest points in the New York City area.

Why can it be seen? Because the Chrysler building is a shining monument to the sheet metal contractor's artisanship. The building is in truth a sheet metal contractor's dream come true.

On this great structure sheet metal has been used to sheath exterior walls, to roof the tower and form the gigantic pinnacle which tops the building, and in intricately worked detail form the huge ornaments which embellish the corners and setbacks. The two great entrance doors, too, are of metal and glass.

On this building more than 80,000 pounds of metal were used by the sheet metal contractor. Yet equally, if not more astonishing, is the fact that all this metal is Enduro stainless steel known to the trade as KA2. In addition there are a number of aluminum spandrels under the windows of three floors and aluminum backed handrails and bolting plates along the edges of the setbacks.

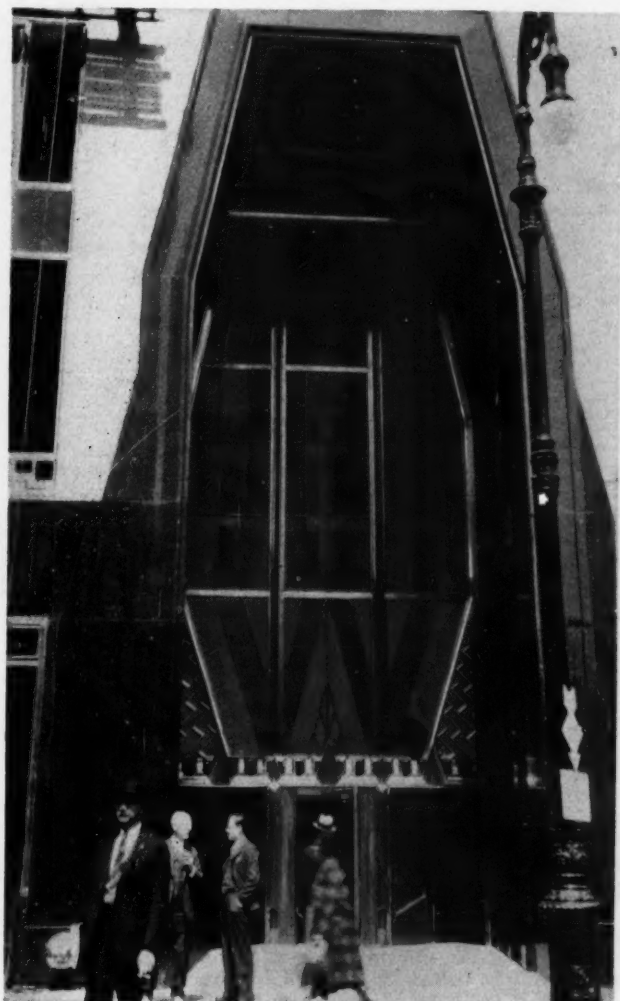
The contractor for the sheet metal work is Benjamin Riesner



# A Sheet Metal Man's Dream Come True!

Sons, 353 East 78th Street, New York City. The contractor has been one of the pioneers in new materials in and around New York and is known to architects as a firm which from long experience can advise on metal work. This is illustrated in the Chrysler building,

Above — Looking along one of the setbacks of the west face of the building. Three of the gigantic pineapples can be seen at the corners of the building and the court. A fourth one is behind the camera



This is the 42nd street entrance door. The glass is of different colors and is all held in place by mullions made of Nitrosta steel. The door frames, too, are of this metal and the doors themselves are sheathed in stainless steel. The modernistic ornamentation of the doorway is done in Nitrosta.



where the design of the tower was changed at Mr. Riesner's suggestion so as to enable him to do a more satisfactory and artistic job.

The story can't be told in words. Before you read any farther, stop and look at the pictures. They tell a story that ought to warm the very bottoms of any sheet metal contractor's heart. Just look at the huge ornaments and figure out the





A closeup of the pineapple. Full description is contained in the text. You can see the seaming and the riveting of the material

intricate design and workmanship which went into their construction. One of these ornaments, alone, would be a fair sized job for some of the shops around the country. But on this building these large metal embellishments were installed in fours and sixes and eights merely as ornamentation.

Let's just take a look over the work to begin with. Let's visit the job, as we did, and look over the details. Then we can take up the facts and figures.

The building stands between 42nd and 43rd streets, with one entrance on Lexington avenue. Regardless of what street we may take to approach the building we can see it towering into the sky for miles down the street. Of course it does seem as though some of the building's neighbors are almost as high, but that is the perspective. If you want to prove that, look at the full length picture of the building. That picture was taken from three

blocks away and from the top of a 36-story building which from the street seems almost as tall as the Chrysler building. Yet by looking at the Chrysler building as the camera did, we can see that the surrounding buildings are pigmies.

As we go through the great street doors which occupy a full three stories of the front, we begin to get an idea of what the modern architect when given a metal such as KA2 can do. Those great glass and metal openings were designed and made by Lupton of Philadelphia. We can't quite grasp the colors of the glass from a black and white picture, but we can see that there are different colors. The doors proper and their frames are also of metal, while the ornamentation of the framework was worked out in metal. The result gives us our first thrill as metal workers.

Of course we could take over the whole book to describe the details of the main lobby. The architectural papers have been full of it for months. All we need mention is that the effect of varied colored red marble with glistening shiny metal ornamentation and lights and reflectors is all that could be desired. Those lights which operate indirectly upon the walls, by the way, are also of metal, in keeping

with the metal of the exterior.

We could recite columns about the elevators. The cabs, let us mention are of inlaid woods, light colors and dark colors, laid in an intricate and modern pattern and set off into panels by metal strips, again carrying out the brilliant note of the exterior metal trim.

But we must be on our way. The cab shoots up. Our destination is the 24th floor. We get out and march out onto the second setback of the building. You can see it plainly in the full length picture. On this level we are going to examine one of the huge ornaments—the pineapples.

Now we might just as well pause here and explain a little something about this building. It was conceived as a permanent monument to the Chrysler corporation and the Chrysler car. We can understand this a little better when we see some of the other ornaments. These pineapples are gigantic things. Just look at the picture and compare the height of one of them with the height of the handrail which strikes a tall man at the waist. These pineapples are probably symbolical of some part of the corporation or the car, but in spite of much questioning, we couldn't find anyone who knew just what they did represent



This picture was taken inside the wings of the radiator cap. The bottom sheathing of KA2 is in place and the workman is putting on the angle irons to which the top sheathing will be bolted. Note the large amount of forming work at the front of the wing

so we'll pass that by. We're interested in the things themselves, anyway, and not in what they represent.

Just glance over at the picture again and notice the intricate design. Notice, too, the large number of parts and see how the parts have been skillfully soldered and riveted together. The picture was purposely taken so that the seams would stand out in order that you readers might get an idea of the construction. Naturally, these seams won't be so noticeable from the street 24 floors below.

From an examination we would say that the ornament was made in several parts. First there is the base which takes in the first roll of the pedestal. To the top of this base is fastened a lower section in which the flutes begin to open out. The right name for these flutes is bracts, according to the dictionary, so let's call them that. The edges of the bracts which face the outside



This picture shows the radiator cap from below. The bottom of the wing looks like the bottom of a speed boat. The cap proper is flat and of huge size. It is 15 feet across the ends of the wings

construction was used as in the section below. Then above this is a second series of bracts, but so placed as to seem to be coming out from behind the outer layer. These two parts are topped with a conical or bullet shaped head. The picture

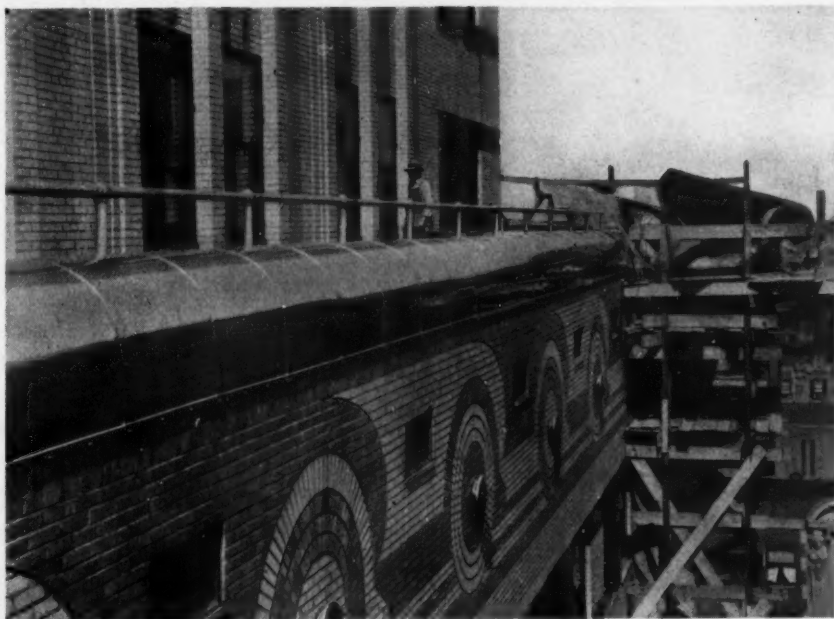
formed by Miller and Doing, Inc., of Brooklyn. The full sized models were secured from the artist. From these models, dies were made and the sections stamped up in as large pieces as possible.

This ornament had its original plan laid out in a model from a sculpture's table. The sections were then taken off a full sized model and cut from metal.

We would just like to call attention here to the fact that while only two of these ornaments show from the 42nd street side if we walk around to the west or east face we can look at a row of four of them, all shining in the sun.

From where we are now standing we can look along the length of one of the handrails and copings. These copings here are rounded, but there are flat ones elsewhere. The metal here is KA2 also and the rail and supports are of aluminum backed metal. The coping and rail made of metal are resistive to weathering and will serve for the length of the building's life without replacement or deterioration. These copings are on the 24th, 27th, 31st and 57th floors.

Let's get into the elevator again and run up to the 31st floor. Here is one of the most interesting and best known of the metal ornaments—the radiator caps. We're all familiar with the Chrysler radiator



The bottom of the radiator cap ornament is a conical shaped piece of KA2 which tapers down until it is nearly flush with the building. Those round ornaments set into the wall are reproductions of the Chrysler hub cap. The coping is KA2 while the handrail is aluminum backed metal. Nice shiny appearance, eh?

are all soldered—while the valley is solid. This means that one sheet was used to form the faces to two bracts.

From this lower section a second section extends up to form the outer layer of bracts. The same

plainly shows the pieces and their joining. The rivets also show. And by the way these rivets are also of KA2 metal and cost in the neighborhood of three and one-half cents each. Not so bad, eh?

All of the ornaments were



cap—the flat cap with two wings streaming back like a bird in flight. On the 31st floor these caps are reproduced in metal and of such a size that even though you owned the longest Chrysler you could park your car right between the wings facing either way.

The construction of these wings is shown in a couple of the pictures. One picture shows the cap as it appears when we look along the face of the building and see the underside of the wing. The round, flat cap shows below the rail of the scaffold. From this disc, the metal runs down in a conical shape until it is flush again with the face of the building about one floor below the disc.

Another picture shows one of the men fastening a part of the structural frame in place just before the upper part of the metal wing was put in place. The wings have a spread between tips of more than 15 feet, and while they will appear delicate from the street, from where we are looking at them they look much like an airplane wing looks when you are an arm's length away, thick and cumbersome and not at all like it does from the proper perspective.

Let us tell a little something about these wings. Artist's models were first made and changed several times to get just the right appearance. From these small models full sized wings were made of plaster of paris and wire mesh. Every depression and marking of the little model was faithfully reproduced in the plaster of paris mold. Then a male and female die were made from the plaster mold. Between these two dies the metal was bent and pressed and formed until every marking of the little sculptured model was reproduced in enduring metal.

Of course these large ornaments had to be built in several sections. It would be impossible to form a wing sheet in a single sheet. The sheets were pressed and formed and soldered into such size as the contractor wanted to handle in his

home shop. The soldered sections were then taken to the job and placed in position on the prepared structural frame.

It might be well here to note that each of these ornaments has a structural frame under the metal. While the metal has a stiffness and tensile strength of its own when used in such large ornaments some means of assuring great rigidity had to be incorporated. The metal framework assured this.

You can see one of the frames



This shows one of the gargoyles. The workman is soldering one of the lapped seams. Each one of those little rivets cost  $3\frac{1}{2}$  cents. The reflection of the brick gives a good idea of how shiny this metal is

in a view of the interior of one of the radiator caps. Incidentally, if you will look closely at the picture along both ends of the wing you can see that there is nothing under the workmen's scaffold but a lot of empty New York air. Sheet metal work in New York, like structural iron work, gets pretty close to flying.

There is an underside and top side covering for the wing. The cap will appear true to life whether viewed from the street or from the top of the building. Examination will also show the number of sheets used to form one of the sides of the wings and the amount of soldering work which had to be done to get a cap completed.

Now we are ready to make a

long jump. To the 61st floor to be exact. We are now in the tower proper. The elevator shoots up, but we do not notice it for the cars have an inside door which closes and all we can see is a box of nice wood and we have none of the sensation of going up fast.

This floor is the last setback of the building. In reality it is the beginning of the tower and also the beginning of the most interesting and biggest part of this job.

At the four corners of this floor

are gargoyles. Huge, fearsome things which project out from the corner like great birds of the air swiftly pursuing their prey. That may sound romantic, but take a look at one of the pictures and see if that description isn't about correct. Incidentally when taking this picture we caught one of the men, busy soldering some of the last seams.

An interesting feature of this picture is to be found if you will look at the back end of the neck. Notice those uneven bricks there. Well, those aren't bricks, but is just the reflection of the brick wall in the mirror-like surface of the metal. That ought to give you some idea of the appearance of this metal

(Continued on page 42)



# A. E. Munkel Says— HE WHO HESITATES IS LOST

**H**E who hesitates is lost, and he who sits back and cries and wails about business being bum will be lost, too, unless he snaps out of his lethargy and awakens to the fact that this is the day of merchandising and the day of the tinker is gone forever. Does the public care if he is gone? Not on your life. The public doesn't care a tinker's dam for the tinker, so get out of that class and start to merchandise what you have to sell, in a real businesslike manner, and you will not only create public respect but will be a credit to your industry as well as your community.

The old saying, which is as true today as it was a hundred years ago, was something on this order: "Don't wait for old bossies to come in to be milked, but get busy and go out and find her and milk her." Then the other saying, "Never milk a calf until she is a cow," is another to be remembered. I only make mention of these old adages for fear you might have forgotten them.

Don't cry about the times being hard, that's not going to help you for a minute, for we don't live on sympathy, and if you have the foolish idea that the other fellow likes your tale of woe, just try it continually for a day or so and you will soon realize that he has troubles of his own and don't care to hear about yours.

Be a man! Be a merchant! Get organized if you are not already so.

People aren't buying as many furnaces in summer as they do in winter, we all know that, but give your public something new to think

**And A. E. Munkel Ought to Know, for He Has Been Installing Warm Air Heating Plants for 31 Years. Also He Is One of the Best Known Heating Men in the State of Ohio**

about, sell them something new in the way of modern ideas, and if you put the proposition up to them in the right way they will be interested. But, on the other hand, if you are only selling a furnace, you might just as well not bother the prospect.

As I mentioned before, organize a selling force. Put it into effect today. Coach this selling force for a week and then start them out with modern ideas of air conditioning. Tell your prospect that you are not trying to interest him in a heating plant that he uses only 200 days in the year, but sell him on the idea of a modern air conditioning plant that is his to use 365 days in each year.

There are so many antiquated heating plants in America that it would be impossible to take care of all of them, but these are your prospects: Why, my dear readers, there are so many good prospects who are just anxious and waiting for someone to come to them with a new idea that will create greater comfort, that it is just a shame that our industry has been asleep all these years. We hope at last that we are seeing the light of day.

The average American wants comfort and is willing to pay for it, but he is not looking *you* up. It

is your job to go to work, instead of crying about poor business conditions.

Bear in mind that there has been more progress made in the warm air heating game in the past five years than had been accomplished in the fifty years previous. I know that the average dealer of warm air furnaces in the past has felt the same as I have about the industry, especially when he happened to be in competition with the steam or hot water man. But today, you are farther in advance of the steam, hot water, or vapor man, than he ever was over you.

For example, today, you can refer to his method of heating as an antiquated idea, and when you say this you can back it up by real scientific arguments. Bear in mind that you are in one of the best games in the world and if you keep pace with the times, you will not only be doing a big job, but you will be creating new enthusiasm each day.

I would like to impress on every furnace man's mind that I am proud that I am in an industry that offers such a varied opportunity for doing the public a service that one can refer to and be proud of. I fully believe that within the next few years, we will have eliminated the tinker and be enjoying a business where real merchandising and modern business ethics are in vogue.

So don't forget, even the old chicken knows that the worms are still in the ground, but you have to dig a little deeper to get them in dry weather.

***There's Lots of Meaty Stuff Scheduled for the Meeting of the National Association of Sheet Metal Contractors. The Date Is June 10, 11, 12 and 13. The Place Is Pittsburgh, the Fort Pitt Hotel. If You Are Going on that Vacation This Month Why Not Take in the Convention?***

# In This FORCED Warm Air Installation Two Furnaces Do the Work of Eight!

**T**HE Ruth Apartments, 12009 Buckeye Road, Cleveland, O., needed a revamping of their entire heating system, and naturally the question arose as to the economy and efficiency of warm air heat for such a large installation. The building having four stores and four suites, a total of 26 rooms on the second floor, it was understood that efficiency was a prime requisite in determining the heating system to be used.

Six years ago, when the building was erected, eight furnaces had been installed to take care of this job, but still it was felt by the owner that the ideal heating system had not been obtained. Yet the advantages of warm air heating were so obvious that our engineers studied this problem carefully, knowing that a warm air heating system, properly designed by competent engineers, would be the most satisfactory and economical type of installation.

In the old installation the eight furnaces were distributed in this way: Each of the four stores on the first floor had its own furnace. Each suite on the second floor had its own furnace. It was found that some of the furnaces, after six years use, did not have one single sound part. Here was an installation neglecting the elementary standard code requirements, proving its inefficiency as well as its costliness, and necessitating considerable expense year after year for repairs.

Little basement opening stubs were substituted for the air returns, completely eliminating the gravity principle. After dismantling the eight furnaces it was found that

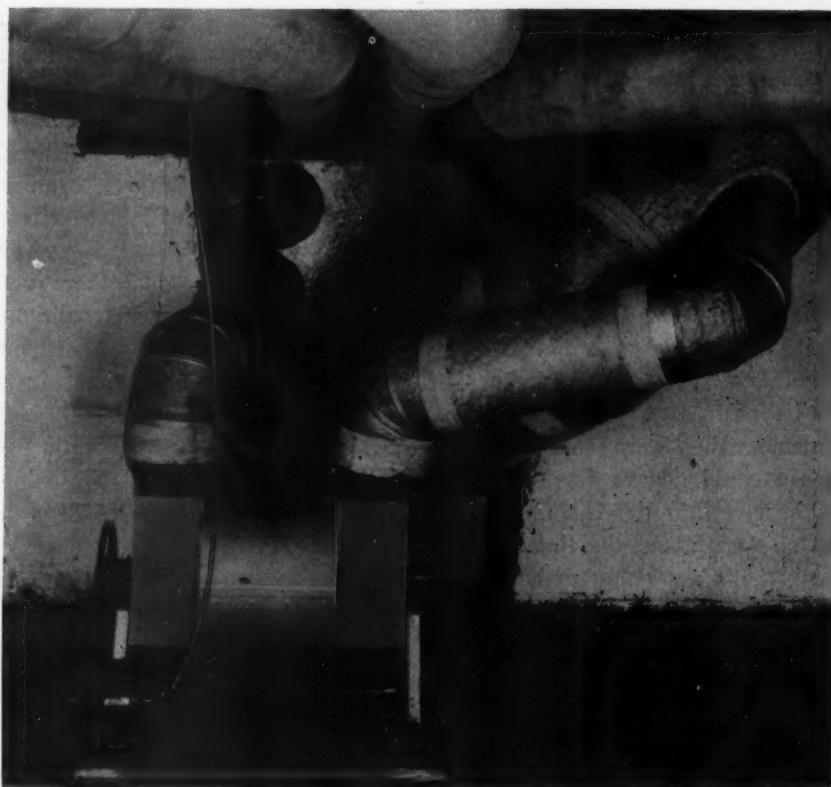
**By D. DIAMOND**  
*Union Heating Company*

some parts were totally burned out, being in itself sufficient reason why the owner wanted to reject the warm air system.

In determining the new warm air

chanical warm air heating; that is, where a powerful, efficient blower, having the requisites for continuous service, is installed in conjunction with a good warm air furnace of standard code requirements.

The new installation is divided into two parts, one of which we will



The above illustration shows one of the Union furnaces with the Furblo blower installed and ready to operate. Note the two cold air returns leading to the two cold air inlet boxes, the recommended practice for this type of blower

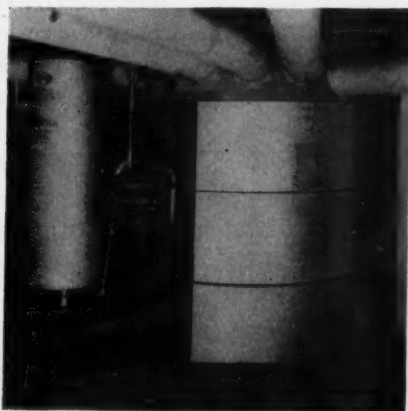
installation it was found that, by using the proper sized furnace, together with the correct size of furnace blower, two furnaces could not only take the place of the eight formerly used, but would eliminate entirely any inefficiencies formerly present. Right here is a splendid example of the possibilities created in the warm air heating field by me-

call the right hand, and one the left hand installation. Each furnace now heats two stores on the first floor and two suites of 13 rooms on the second floor. Two 24-inch diameter cold air pipes supply the air to each furnace. The air is taken from each store heated by the furnace. Each of the two Union furnaces has to take care of a 1200



**In this very interesting article Mr. D. Diamond, heating engineer, Union Heating Company, gives a graphic illustration of how mechanical warm air heating successfully solved the planning and installation of a difficult heating job. This particular installation has attracted widespread attention, yet it is just an ordinary example of what can be done with mechanical warm air heat**

square inch heat loss. The largest size cast iron furnace we could use, because of the building situation, had a capacity of 907 square inches. To raise the furnace capacity it was imperative to use a blower for this purpose alone, regardless of their

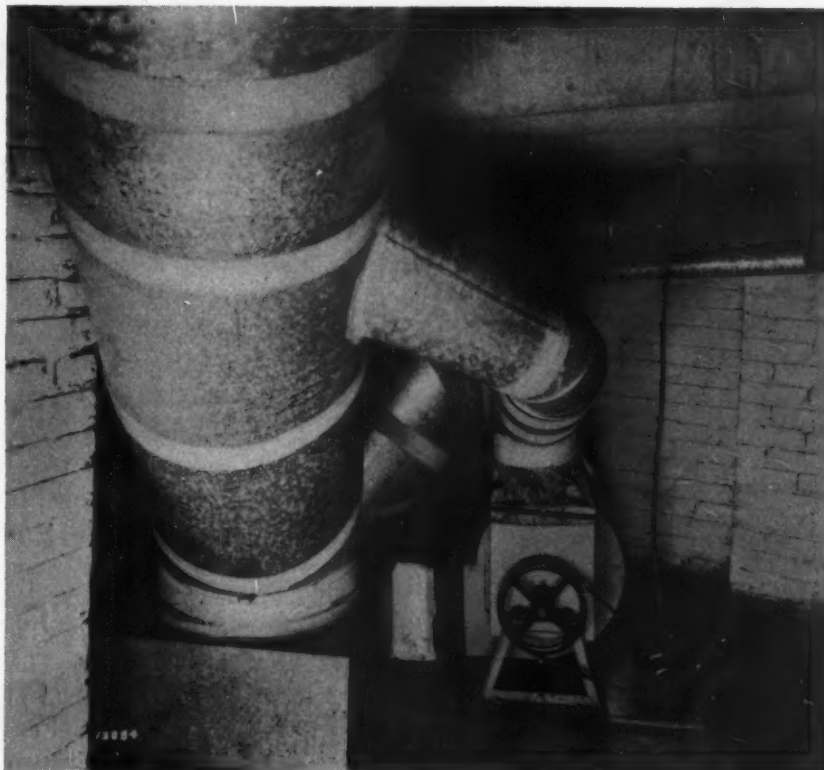


**Three-quarter view of Union furnace**

well-known advantages to such systems. After careful study of the problem it was decided to use the Furblo blower, which, figuring a 40 per cent increase in capacity, would take care of a minimum of 1270 square inch heat loss, B.t.u.

Of course automatic control on each furnace regulates the operation of Furblo. With these controls the blower operates only when it should, immediately giving the benefit of all heat generated in the furnace.

That this installation was more than satisfactory is testified to by



**A view of the second furnace, which shows plainly the cold air returns leading into the cold air inlet boxes on the blower. Air is then blown through furnace with sufficient force to heat every cubic foot of store and apartment space**

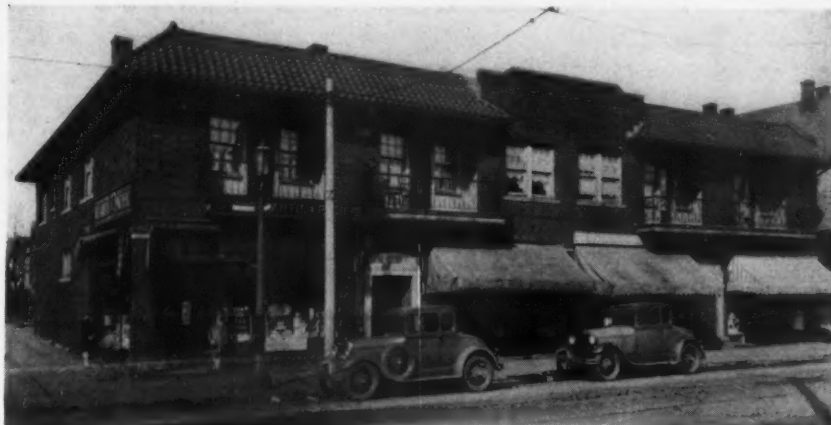
the owner of the building, whose own words were: 'Each installation has been a complete success.' He goes on further to say that the installations have equaled all expectations and definitely states his opinion that this type of installation will find favor more and more with large apartment buildings.

We are more than pleased to know that the efficiency of the equipment used and the design perfected by our engineering department resulted in a system so satis-

factory to the owner.

This job presented quite a problem, not only because of its size, but also because of the complicated heating requirements of the layout. We believe that it would have been impossible to heat this building with a gravity system, but the use of the forced air system solved the problem.

We receive many inquiries from large apartment owners for installations similar to the one described in this article.



**Photograph of the Ruth Apartments, Cleveland, which gives an idea of the obstacles to be overcome in heating four stores and four suites with only two furnaces. Mechanical warm air heating turned the trick**



# Development of Special Elbow

For E. W. Robinson, Bridgeton, N. J.

By W. R. HAINES

Contributing Editor

**T**HIS problem is a layout of a 90 deg. elbow with one rectangular opening from fan of 30 in. by 48 in., and a rectangular opening from duct of 20 in. by 67 in., with the offset all on one side. I have changed this pattern a little by making a break at point x on front view of drawing. This break makes a better looking job mechanically, and also gives the elbow full capacity as nearly as is possible with required measurements. The fan opening gives capacity of 1,440 inches of air, while the duct opening gives only 1,340 inches. This in accord with measurements submitted by subscriber, which are no doubt correct.

The first step in layout is drawing the front view and plan, which to save space have been drawn in one. Thus the entire layout can be made from this one drawing.

In the development, first draw

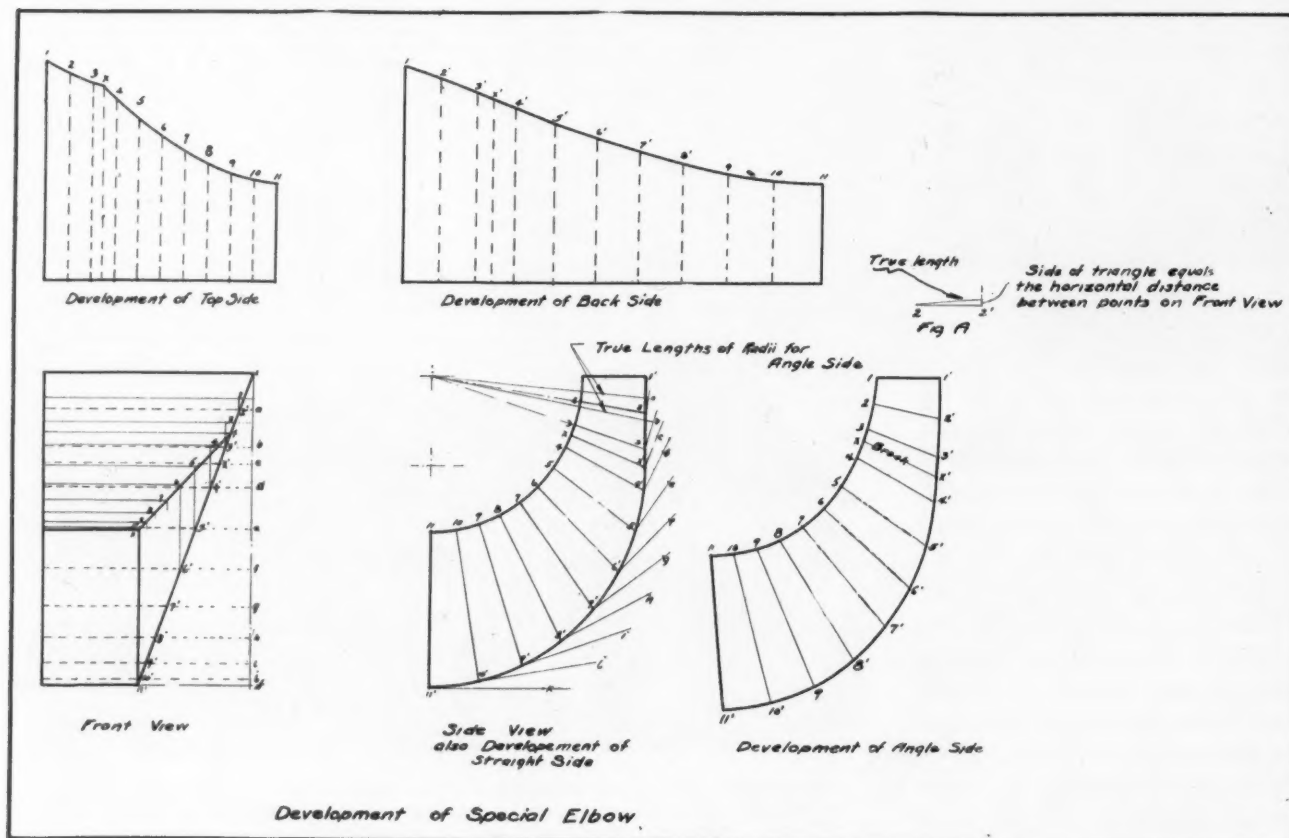
the flat side of elbow, which has throat radius of 48 in. The heel radii are determined by extending the 48 in. radius to 68 in., and the distance from point 11 on throat to point 11 on heel is known to be 48 in. Then set dividers at radii points, as shown on side view, and scribe arc to point x.

The next step is to develop the top side or throat of elbow. This is done by dividing the arc 1 to 11 on throat into equal parts, and extending lines across side view of elbow to heel. This makes a simple development for angle side. Next project lines from 1 to 11 on side view over to plan view. The true lengths are then laid off with dividers as shown on top side view. Development of back side is in exactly the same manner.

Development of heel on angle side is shown very clearly on drawing. The true lengths are determined by use of dividers from point 11 to K, 10 to J, etc., then scribing an arc on side view from point 11, point 10, etc., which will give the correct layout for heel on angle side.

Development of throat on angle side is determined by using stretch-outs from point 1 to 2, etc., on top side development. Project lines from point 2 to 11 on plan of throat to same numbers on front view, and by the use of triangulation, step off from point 11 on heel of side view to point 11 on throat, point 10 to 10, and continue development as shown.

This is a simple and easy way of developing the pattern, and as the layout explains itself to a great extent, it is not necessary to take a lot of space with explanations.



# From the Coal-Furnace Conference

## Read These Excerpts

**T**HIRTY-SEVEN persons interested in the coal industry and in coal heating equipment attended an all-day conference held at the Union League Club, in Chicago, May 8. The underlying purpose of the meeting was to promote coal-consumer comfort, and a wide range of activities that might be carried on through coordinated effort was considered. H. A. Glover, chairman of the Trade Relations Section of the Market Research Institute of the National Coal Association, which is the nation-wide organization of bituminous coal producers, presided.

Among the subjects considered were a joint sales program of the heating equipment people and the coal industry, an industry service organization that would in a sense supervise both equipment and fuel, contacts with architects and contractors and a central information service that would record all major developments in coal burning and coal handling equipment and in competitive fuels. A long list of "abuses" was discussed and the unanimous opinion was expressed that through a permanent organization substantial benefit to all interested industries could be secured.

A Resolutions Committee was named, headed by E. B. Langenberg, president of the Langenberg Manufacturing Company, St. Louis, Missouri, which reported this resolution, which was unanimously adopted:

Whereas, The coal, heating, stoker and accessory industries have, within their own respective organizations, felt that there exists a community of interest that could be advantageously developed through coordinated effort, and,

Whereas, Many subjects of vital interest have been developed in

the discussion at today's meeting concerning which it is obvious the organization of a joint committee would be helpful with a view to clarification and the establishment of a policy which, if followed out, would be of material benefit to the various industries involved.

Now, Therefore, Be It Resolved,

**"The coal man blames the furnace. The furnace man blames the coal. The coal man don't know furnaces and the furnace man don't know coal. We got them to pull together in St. Louis. One dealer turned over to our company more than \$20,000 of business in the last three months. That's co-operation."**

**—E. B. Langenberg.**

That this conference recommends to the various organizations represented, and listed below, that they authorize the establishment of a permanent committee to be composed of one representative from each organization or group and that this committee meet on June 17, at the Union League Club, Chicago, at 10 o'clock A. M., this committee to organize and then to create a plan by which industry co-operation can be carried out.

The warm air heating industry and its allied industries were represented by—

E. B. Langenberg, Langenberg Manufacturing Co.

Lorin W. Smith, Minneapolis-Honeywell Regulator Co.

J. Harvey, Manny, Robinson Furnace Co.

James Brown, Standard Foundry and Furnace.

Many things of importance to the warm air heating industry were discussed and some very forceful and helpful statements of conditions were made. We would like to quote some of them—

H. A. Glover, general manager of sales, Consolidation Coal Co., said: "The National Coal Association had for some time felt that the coal producers and the manufacturers of heating equipment had a great many things in common. As a result of that feeling, a meeting was held in Philadelphia in January of committees representing the National Coal Association and the National Warm Air Heating Association. An extended discussion of problems of mutual interest was had. It was generally agreed that furnace defects, poorly constructed chimneys, and improper firing or selection of coal, are responsible for the major portion of the domestic fuel complaints. The discussion embraced the desirability of standard chimney construction, firing instructions, co-operative effort by local furnace and coal dealers for furnace inspection and repair, and a general effort to give greater heating satisfaction."

One of the most active participants in the conference and in the preliminary work was E. B. Langenberg, of Langenberg Manufacturing Company, St. Louis. Speaking of the experience he had with co-operation in St. Louis he said:

"My experience on the Smoke Abatement League of St. Louis brought me in contact with coal men. I found that the coal man was blaming the furnace man, and the furnace man, tinnerns and others

were blaming the coal man. We worked out a plan by which our company would service any complaints which the coal retailers happened to receive in their business. That plan has worked out very well. The retailers have turned over to me pretty close to one hundred thousand service jobs a year. This service has not only enabled them to hold their customers, but it has relieved them of all servicing work and has made for much greater satisfaction all around. The coal men didn't know the first principles of combustion; I felt that they should know something about that. We got busy with them and started a campaign of education that has turned out wonderfully. *One dealer in St. Louis has turned in to our company over \$20,000 worth of business in the last three months. Coal men have no business working with vacuum cleaners. Any one handling such devices should thoroughly understand the construction of the heating apparatus, or else considerable damage may be done in the way of pulling out cement, etc.*

If we keep each other posted on what's going on we will have information as to that. We must see that the consumer is taken care of

**"Furnaces have suffered ill repute because they are supposed to be dirty. We are responsible for much of that sentiment. We haven't paid enough attention to the installation of our product. Co-operation with the coal people ought to do us a lot of good."**

**—J. Harvey Manny.**

first; we are incidental. We are all here to see how we can get more out of our business, and in that effort we must see to it that the needs of the customer are taken care of. If we can work out a policy, the

details thereof can be taken care of in the various cities and towns. Different types of fuel are burned in different cities; let each group lay out its own individual plan, but this group should set up a policy and pass it down with the force of the national organizations back of the movement.

To start with we should agree to study the problems. Our National Warm Air Heating Association has agreed to go into research work, which we started in 1918. At that time we decided that no matter who got hit he would take his medicine. We have gotten things over to the industry from the laboratory which have increased our capacities, our business, and so on. To start with, we want to do something collectively to get the furnace men, boiler men and coal men together to better serve our customers, and we will all profit by doing that.

Another of the warm air heating industry who has been active in promoting co-operative effort between the furnace man and the coal dealer is J. Harvey Manny, vice-president of the Robinson Furnace Company, Chicago.

Speaking of the value of co-operation he said: "I believe that for the furnace industry Mr. Langenberg has covered the ground very well. Our association is very much interested in this movement. Furnaces for some time past have been in ill repute because they are supposed to be dirty. A great part of that trouble comes from our own industry; we haven't paid enough attention to the installation of our furnaces. Through co-operation all around I am certain much good can be accomplished."

Carlyle M. Terry, of Chicago, manager, Anthracite Coal Service, added: "We probably have had as much experience in servicing domestic plants as any organization. We have made 40,000 inspections of domestic heating plants. We have totaled up the findings of those inspections and have checked those as against the results obtained in the other sections and find that

the results are nearly the same all over. The investigation showed coal man to be blamed for most of the trouble—his coal is not any good, it won't heat, there is too much gas, or something about the coal. In seventy-five per cent of the cases the equipment was in poor condition, the heating surfaces were dirty, or the equipment was undersized; in twenty-four per cent of the cases the firing methods were

**"We have made 40,000 inspections of domestic heating plants. Our investigations show that the coal man is blamed for most of the trouble, but in 75 per cent of the inspections the equipment was faulty—dirty, leaking, undersized. We have run classes in Chicago for retail coal dealers and their men. We also held public meetings before 4800 users of coal. We have talked coal heating and stoker firing to the architects. We would like the co-operation of the furnace man in this work."**

**—Carlyle M. Terry.**

wrong, and in one to one and one-half per cent the coal was actually inferior. That has proven to us one of the reasons why we have lost our tonnage; the consumer is not getting heating satisfaction from his fuel.

We have done much educational work in Chicago. We have run classes in each section of the city for retailers and their employees. We have attempted to take everybody who has attended these classes on twenty service calls in order that they may have a general idea of how to correct the ordinary faults in a heating plant. We have gone back over those sections and held other meetings, which have



been illustrated with moving pictures of heating plants, chimneys, etc. Forty-eight hundred people through the anthracite burning regions have attended these classes. We endeavored to contact with the architects. We took the Dodge building reports, which are as complete as any available, and for one year and a half we called on every prospective home owner, architect or manufacturer within fifty miles of Chicago. We could in a great many cases be assured that the home owner would burn a solid fuel. We convinced the home owner, mind you, not the architect. The latter takes the point of least resistance. There is now an organization selling a hard coal stoker here in Chicago. We begged coal men to take it and they wouldn't; neither would the heating contractors. Twenty-five of these stokers have been sold here and are operating. At Fort Wayne, Indiana, a city in which very little anthracite is sold, they had an exhibition of an anthracite stoker and seven were sold off the floor. The

they simply don't want the fuss of getting in the coal and getting out the ashes; they don't want dirt and they don't want their lawns mused up. They don't care much about the expense. We are putting in gas boilers in these big homes."

Richard A. Miller, of Chicago, brought up an interesting point. He said: "I am interested in the question of the sale of apparatus by coal dealers. I am interested in the question of the thermostat, because I tried to sell thermostats. I had \$120 thermostats with a clock, and \$85 ones without the clock, but I couldn't sell any of them to the people. I tried to find a cheaper heating control and got some \$29 controls, some of which I sold.

I found a great sales resistance against buying anything of the coal dealer because the customers thought it was done with the idea of using more coal. I didn't make any money with the thermostats.

There are a number of things the manufacturers can do. The stoker manufacturer and the furnace manufacturer want to get to

gas burner."

Homer R. Linn, engineer, American Radiator Co., had some interesting remarks to make on chimneys:

"I have found that a great many of our trouble calls were directly attributed to chimneys. Now I don't believe it's up to the coal man to test those chimneys; the architects should be held responsible for them. Several years ago the Architects' Association asked me to write a chimney specification. I took the underwriters' chimney ordinances and picked out the things I thought were pertinent to chimney specifications. I sent them down to a consulting engineer, who took the specifications and blue penciled them and then rewrote the code. It was then turned over to the Architects' Association, and they didn't adopt it for five years. They fought over the clause that provided that the architect was to put a smoke test on the chimney and that he was to sign a statement that the chimney was tight, one copy of which was to go to the owner, one to the

## WHAT'S THIS ALL ABOUT?

★ **There's an idea here. A good idea. That idea is that no matter how small or large your community is you can join hands with the coal man and both profit. He gets into ten times the basements you do. He also is the first one to get a kick. Working together you get more jobs—he keeps his customers.** ★

people want heating comfort in the home."

H. M. Hart, of Chicago, representing the Heating and Piping Contractors' National Association, related his experiences. He said: "Our own particular company has not installed a coal-fired boiler in a new residence in the past three years, to my knowledge; it's either oil or gas. Our work in residences is confined to the better class of homes, but, even so, there is no saving in labor in those installations by putting in gas or oil, because these larger-type homes have house men, janitors and plenty of help—

gether and see that installations are made that have sufficient grate surface in the furnace to adequately take care of the house they are to heat, for if the customer buys a cheap fuel and hasn't B.t.u.'s enough to heat the house, in time he will go to oil or gas. A boiler should be developed for household use that is adapted particularly to stokers and with the idea of a convenient method of ash removal.

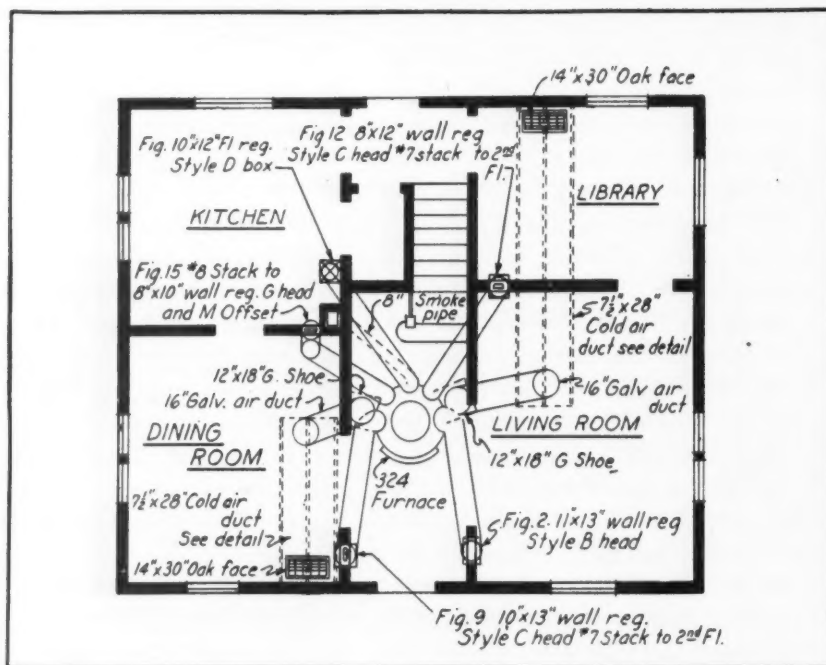
"Some people have their gas burner and coal furnace, too, so they can use either. Last year one such customer burned more coal than he did the year he put in his

heating contractor and one to the mason contractor. Now they have adopted it, but it is hard to get them to use it. They have it in their handbook, and householders should insist that the specifications be put in the contract; tell the mason contractor he must give you a smoke-tight chimney."

Wilson Bridges, Gen. Sales Mgr., Chicago, Wilmington & Franklin Coal Co., added:

"I think we have much in common and we should fight our battles together. We try to do a good deal with the retail coal dealer in edu-

(Continued on page 42)



### ***This Is the Installation Which Has the Floor Drafts***

The floor plan shows the warm air runs from the furnace to the registers. Also the cold air returns. The worst draft is across the hall and the doors to the living and dining rooms. Why the drafts?

## **A Heating Engineer Gives Some Pointers On That FLOOR DRAFT PROBLEM**

**I**N the last few issues we have been discussing a problem in house heating. The original problem was presented in the issue of March 29.

In the April 26 issue we published six answers. We also showed altered sketches giving the changes as closely as we could figure them out from the letters and from the sketches sent in.

In the May 24 issue we showed some more replies which we didn't have space for in the April 26 issue. Again we showed sketches of the altered heating plans as the authors of the letters laid out the changes.

Let's set down again for the benefit of those who don't know what this is all about, the problem as we first published it.

The house is new. It is a ready cut house, but seemingly is tight and without cracks or spaces where air movement can begin. Doors

and windows fit as tightly as usually found in a wood house.

Our observations seem to indicate that the real cause of the air movement is in the heating system. There seems to be a decided movement of the cold air going to the furnace and this is especially noticeable around the doorway between the living room and the hall. There is also movement in other rooms of the first floor. So far we have not had these drafts in the second floor.

The drawing at the top of this article is the architect's plan of the first floor. The heating system is shown in its proper location with the leads for warm air and cold air as they were actually built into the house.

The owner of the house also says that he believes the heating plant consumes at least two tons of fuel a season more than it should. The

furnace has a 24-inch fire pot and is of standard make. Now we all know that two tons of coal a season is hardly worth arguing about. Any fairly poor fireman could easily waste that amount of fuel without even having to get up a half hour later. But just for the sake of argument you might also give any ideas on how a different layout for the system could save fuel.

This problem seemed to arouse so much interest that we felt we would like to have some remarks about it from some recognized engineer. So we asked G. A. Voorhees of Indianapolis to look the problem over and tell us what he thought of it.

We would like to add that Mr. Voorhees is an Associate Member of the American Society of Mechanical Engineers and a Member of the American Society of Heat-



ing and Ventilating Engineers. He is a distributor for Twentieth Century Furnaces and supplies an engineering service for dealers selling these furnaces.

In reply to our request he writes us as follows:

"There is always one drawback in working these problems. It's practically impossible to give in the original problem, *all* the conditions which *may* have a bearing on the matter. Consequently, some additional factors must be assumed in working out a solution. Just because of these added conditions which have to be taken for granted, I've often seen equally competent heating men give quite radically different solutions. It depends on the supplementary conditions that they assume to exist.

"Of the four revised layouts given in the April 26 issue, I like the cold air arrangement of Mr. Kunold's plan best, except that I would make the cold air face in the hall larger and that in the library much smaller than shown. I always

system is delivered to the second floor, isn't it logical to arrange the cold air return ducts so that one third of the cold air is picked up at the foot of the stairway? If we don't do that, how can we prevent drafts across the floor from the hall to the cold air faces in other rooms?

Theoretically, the volume of warm air delivered is proportional to the cross sectional area of the pipe (with corrections made of course, for the higher velocity through pipes leading to second and third floor stacks). But mere 'theory' in this case often leads to trouble.

"That's why there are so many unsatisfactory Holland jobs that have the pipe sizes determined according to code requirements. The code after all, is merely a *basic* set of rules. The man who applies these rules needs to apply them in the light of practical experience which too many Holland salesmen who make the layouts do not have.

"The standard code is theoretic-

every rule in the book and in doing so, to make his work better than would be possible by adhering strictly to the rules.'

"If this were not so, any graduate just out of college could dig the Panama Canal, build a super-skyscraper, OR INSTALL A FIRST CLASS WARM AIR HEATING SYSTEM.

"I didn't mean to drift off into an essay on the philosophy of engineering or whatever you would call it, but there are some general truths that furnace men don't seem to appreciate fully. But to get back to the subject.

"When an installation like this comes to me as a 'trouble job,' I don't pay much attention to the warm air and cold air pipe sizes, register locations, etc., UNTIL I have tested the plant to determine HOW THE HEAT IS BEING DISTRIBUTED.

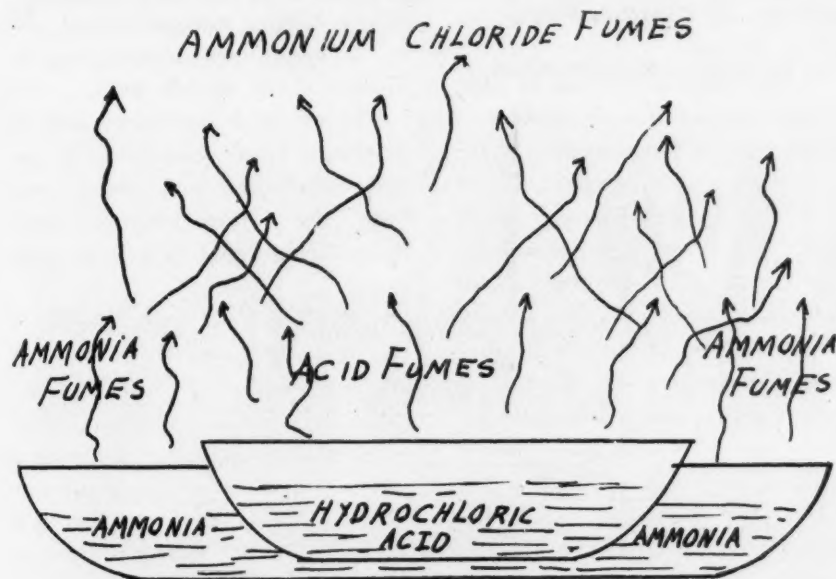
"It doesn't take very long to record the temperature and volume of warm air delivered through each warm air register and from this to calculate the QUANTITY of heat delivered to each room. (A low speed anemometer and several accurate testing thermometers reading up to 220 deg. F. can be bought for fifty dollars or less—and they're worth every penny of their cost to any live heating contractor.)

"Then, having determined how the heat IS being distributed, I figure the heat requirements (code or otherwise) of the various rooms to see how it SHOULD be distributed.

"Then and not until then, I turn my attention to the layout of the plant itself to see how present performance can be turned into required performance.

"Even where there's no complaint of the system other than 'drafts across the floor' as in this case, I find it desirable to make the more complete check-up outlined above. The information thus obtained is almost always of value.

"The next step in a case like the one under consideration, would be to test the air flow along the floor



Two dishes which will fit into one another, some ammonia and hydrochloric acid are all you need to stage an impressive air movement test. And the beauty of the thing is that it really does do the trick 100 per cent efficiently

try to apportion my return air openings to correspond to the volume of warm air delivered to the several parts of the house. If we assume for illustration, that one third of the volume of air circulating through the warm air piping

cally correct and it is also PRACTICALLY correct if its rules are used with judgment based on experience.

"No engineer is worthy of the name unless his experience and judgment enable him to violate



with ammonium chloride fumes to determine direction of flow and relative velocity, plus a thermometer test to get the temperature of the moving air that's causing the complaint.

"Air currents can be traced after a fashion by blowing smoke into the air, but the smoke tends to rise because it is somewhat warmer than the room air, and if the air is moving slowly the test isn't likely to be fully satisfactory.

"The ammonium chloride fumes are generated right in the path of the air current being tested and enter the air at a temperature about the same as the air itself. Therefore, they are more reliable and satisfactory than smoke.

"Ammonium chloride machines can be bought for about \$20, but I prefer two shallow glass dishes as shown by the diagram. Any heating contractor can generate the white chloride fumes by pouring strong ammonia in the larger dish and concentrated hydrochloric acid in the smaller one. (Ordinary 'household' ammonia won't do as it is too weak, but 28 per cent ammonia can be obtained from most druggists and should be used.)

"I prefer to always place the acid in the inner dish as these fumes are highly corrosive and if poured into the outer dish with the ammonia inside, some of the acid fumes could escape without being neutralized. On the other hand if the acid fumes rise from the inner dish, they are surrounded on all sides by the strong ammonia fumes which react to form the white ammonium chloride (sal ammoniac) fumes.

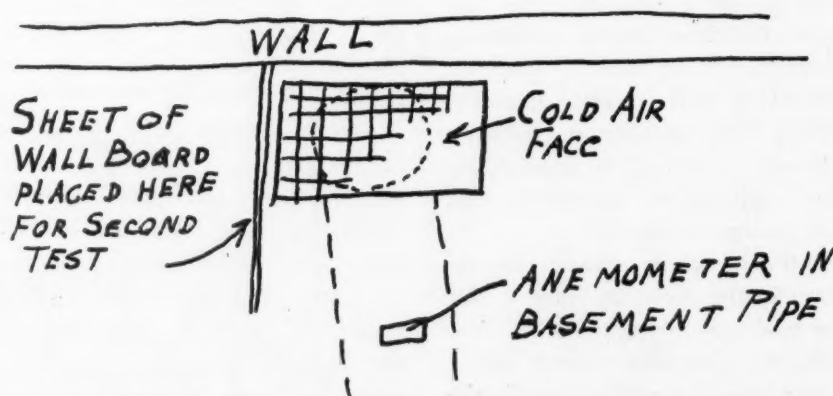
"In the job that we're considering here, it's quite probable that the cold draft is air moving from the foot of the stairs to the cold air faces. But it MIGHT be and is in many cases, a current of air flowing along the floor toward the warm air register. The ammonium chloride test would show.

"One heating contractor was troubled with a floor draft in his own living room and found it to be

a current flowing toward the warm air register. But a great many furnace men **INSTEAD OF FINDING OUT JUST WHAT IS HAPPENING**, jump to the conclusion that air flowing along the floor is always flowing toward the cold air face. They make a change in cold air arrangement and then wonder why their customer still kicks. This is one reason why I insist on a very thorough test of existing conditions before tampering with any heating plant in an

the cold air faces along the inside walls. In a great many cases of course, we alter this rule and go to an outside wall **BUT NEVER UNLESS THERE IS A SPECIFIC REASON FOR IT**. In this particular house, I don't see anything to be gained by lengthening the cold air ducts.

"I don't agree with Mr. Van Evera's contention that a cold air face located in a corner is only 65 per cent efficient. I realize that there's quite a difference of opinion



This is the layout of the corner register efficiency test discussed in the text. Next time you have a good location in a new job try it out yourself

endeavor to overcome some reported trouble.

"I mentioned above that in addition to tracing the air current, I would take its temperature. In the case of the all too prevalent *dry* air we find in so many homes, it may be the velocity of the air movement rather than the temperature of the air that is causing the kick. When the air is quite dry, it doesn't take much movement along the floor to cause a chilly sensation around the ankles and as there is always bound to be air movement at the floor line it's evident that relative humidity ought to be determined also when testing a plant. I've known of cases where the installation of an automatic humidifier of proper capacity has remedied the 'cold draft' trouble—but I'll admit that I've never found *many* such cases.

"Another fault I find with the original layout of this job is the placing of the cold air faces at the outside walls. For years we have followed a *general* rule to locate

among heating men as to this just as there is about placing the air intakes at the outside walls.

"So far as I have been able to determine from observation of actual installations and one or two tests, the corner location, other things being equal, is just as good as any.

"Here's how I tried it out: I placed an anemometer in the cold air pipe connecting to a face located along a wall and took several velocity readings. Then I placed a section of wall board along one side of the face (see drawing) and took a second set of readings. The results were practically the same, and I don't see how there could be any appreciable difference in results whether a section of wall board about three or four feet high is placed along one side of the face, or a wall is placed there because the air movement to the face is within a few inches of the floor. However, I could easily be mis-

(Continued on page 43)

# Correcting A 15-YEAR OLD CORNICE ERROR

THE photograph on this page shows a very interesting piece of reconstruction which has just been completed on the Hotel Muehlebach in Kansas City. Probably every reader who has ever visited Kansas City knows this famous hotel.

When the hotel was built in 1915 the architects specified a terra cotta cornice for the ornamental course at the twelfth floor line. This heavy cornice necessitated a strong and heavy structural steel supporting framework, as the projection was considerable and the material heavy. This year an inspection showed that disintegration had set in, with consequent danger to pedestrians passing on the sidewalk below.

## METAL CORNICES

### *Save Costly Replacements*

**Why do builders, contractors and architects prefer Metal Cornices to terra cotta?**

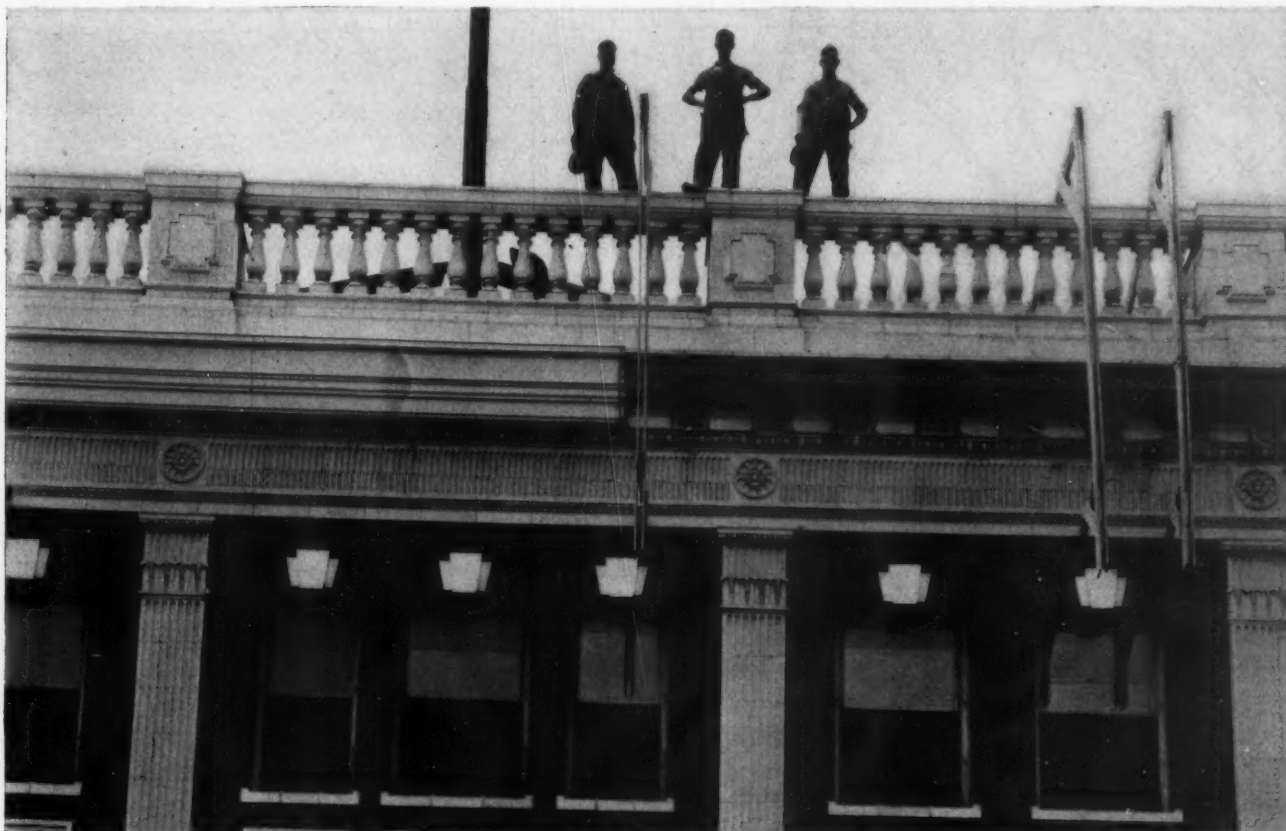
**Because Metal Cornices never chip, crack or slip out of place. Because the severest extremes of heat and cold cannot damage them. Because they rarely if ever need attention. Because they actually outlast the building itself!**

Falling pieces of stone or synthetic stone cornice work have become quite common occurrences of late, as buildings built from fifteen to twenty years ago, when this type of cornice was in its hey-day, now begin to feel the effects of time and weathering.

Rather than face the possibilities of damage suits or financial loss brought about through injury to pedestrians, the owners of the hotel determined to remove the heavy cornice and substitute a lighter, safer and more permanent cornice made of metal.

Plans and sketches were drawn up and bids asked. A. Zahner & Company, sheet metal contractors,

*(Continued on page 43)*







line 6-10 at point 4'. From 4' draw the angle P-4'-15. In this case the slope is 45 deg. and the length of the line 4'-15' the length of the prong, which is 8 inches. At right angles to 4'-15' draw the line 13-17 through point 15'. Upon this line and using the radius of the small opening of the prong, 2 inches, draw and number the half profile as shown. Now draw perpendicular lines from 1, 2, 3, 4, 5, 6 on the miter line of the plan intersecting the horizontal in the true elevation at 1, 2, 3, 4', 5, 6. From this horizontal line step off on the perpendicular lines just drawn distances 3-3, 4-4, 5-5, etc., found in O and number similarly. Draw through the points the view of the section, which is foreshortened. Now connect the points 13-10 and 17-5. This completes the view of the elevation.

Next draw lines parallel with the center line 15-4' from each of the points 14-20, 15-19, and 18-16, intersecting the line 13-17, and number as shown. From these points of intersection drop lines through the center line C-D. Now using the distances on the half profile of the elevation, as 14-20 to 14-20', 19-15 to 19-15', etc. Step off, above and below center line C-D in the plan, on the lines previously dropped from 14', 20', 15', 19', and draw the elliptical opening shown by 13, 14, 15, etc. Connect the points 15 and 12 and 19 and 2 by drawing lines between these points.

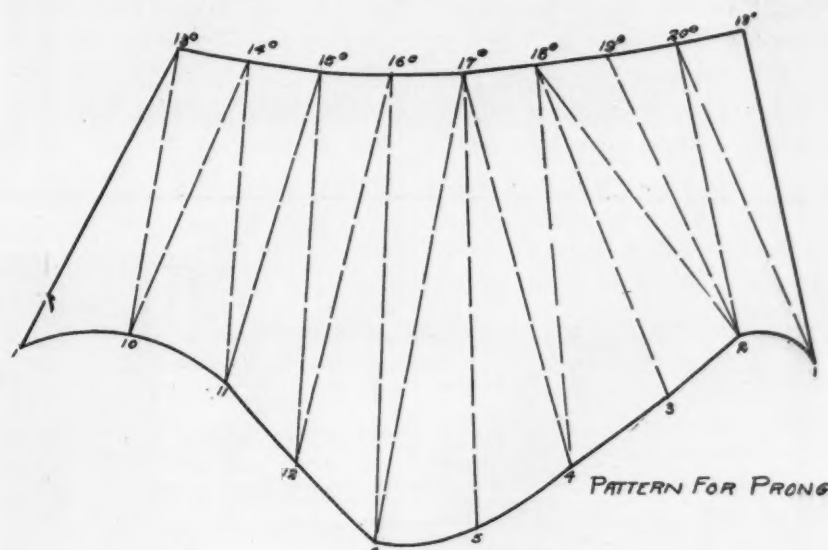
Lines must now be drawn in the plan representing the base lines of the triangles to be used in constructing the diagram of true length lines. To avoid confusion the lines from 1 to 6 on the plan are drawn solid and the remaining ones are made in dashes. Beginning with the seam, connect points 1 and 13, 13 and 10, 10 and 14, etc., until around to point 6, then use the dash lines in connecting the remaining points.

We are now ready to begin the diagram of true length of lines. From *m* in the elevation draw line *m-n* of indefinite length. Now from the points 13, 14'-20', 15'-19', etc., in the elevation draw other hori-

zontal lines of indefinite length. In the diagram of true length lines we will again begin with the seam line 1-13. Take a point 1 on the line *m-n* far enough away from the elevation view that the view and diagram of lines will not overlap. Next, from the plan take the distance 1-13 and step it off on *m-n* and from the point 13 drop a line intersecting the horizontal line from point 13 in the elevation. The intersection of these two lines locates point 13 deg. and the distance from 1 to 13 deg. is the true length of the line 1-13 in the plan. Next from the plan take the distance from 13 to 10 and step it off from 13 on the line *m-n* and draw the line from point 13 deg. to point 10 on line *m-n*. Next, from point 10 on *m-n* step off the distance 10-14, drop a line from 14 to 14 deg. and draw a line from 10 to 14 deg. Then take the distance 14-11 on the plan and step off this distance on line *m-n*,

length of 15-12. With the distance 12-16 on the plan step it off from 12 to 16 on line *m-n*, drop a line from 16 intersecting the horizontal line at 16° and connect 12 and 16°. Next, with the distance 16-6 found on the plan step off the distance 16-6° on line *m-n* and connect points 16°-6°. This completes half the distance around the pipe.

The remaining lines are shown in dashes to avoid confusion. With the distance 6-17 on the plan step off the distance 6°-17 on the line *m-n*. Drop a line from 17 intersecting the horizontal line at 17° and draw line 17°-6° in dashes. Next step off distance 17-5 in the plan on the line *m-n* and connect 17° with 5. Next step off distance 17-4 found on the plan, on line *m-n* and connect 17°-4. Then take distance 18-4 on the plan and step it off on line *m-n*, drop a line from 18 intersecting the horizontal line at 18° and draw line 18°-4. Next take



A pattern for the prong

and draw a line connecting the two points 14 deg. and 11. Take the distance 11-15 on the plan and step it off from point 11 on line *m-n*, drop a line from point 15 intersecting the line from 15' in the elevation view, numbering the point of intersection 15°, and then draw a line connecting 11-15°. Next take the distance from 15 to 12 in the plan and step it off from point 15 on line *m-n* and draw a line from 15° to 12, representing the true

distance 18-3 on the plan and step it off on *m-n* and draw line 18°-3. Next take distance 18-2 and step it off on *m-n* and draw line 18°-2. Step off distance 19-2 on line *m-n*, drop a line intersecting the horizontal line at 19° and draw line from 19°-2. Next step off distance 2-20 in the plan on line *m-n*, drop a line from 20 intersecting the horizontal line at 20° and connect points 20°-2. Next step off distance

(Continued on page 43)

# AN AIR COOLED SYSTEM

## Which Provides Just the Right Conditions for Candy Making

THERE is fast arising a profitable field for the sheet metal contractor who will specialize in industrial installations. No better example of this need be cited than the work of Charles B. Rundell, "Charlie" to practically every sheet metal man in Ft. Wayne, Indiana.

Charlie Rundell used to be one-half of the firm Rissing and Rundell, a sheet metal shop known all over Indiana before most of the present generation of artisans were even cutting pictures out of magazines. Today, Charlie, carrying on under his own name, has widened his field until he finds his jobs bringing in new business all the time and his time given over more

and more to work in industrial establishments.

He has found the industrial field especially fertile and profitable.

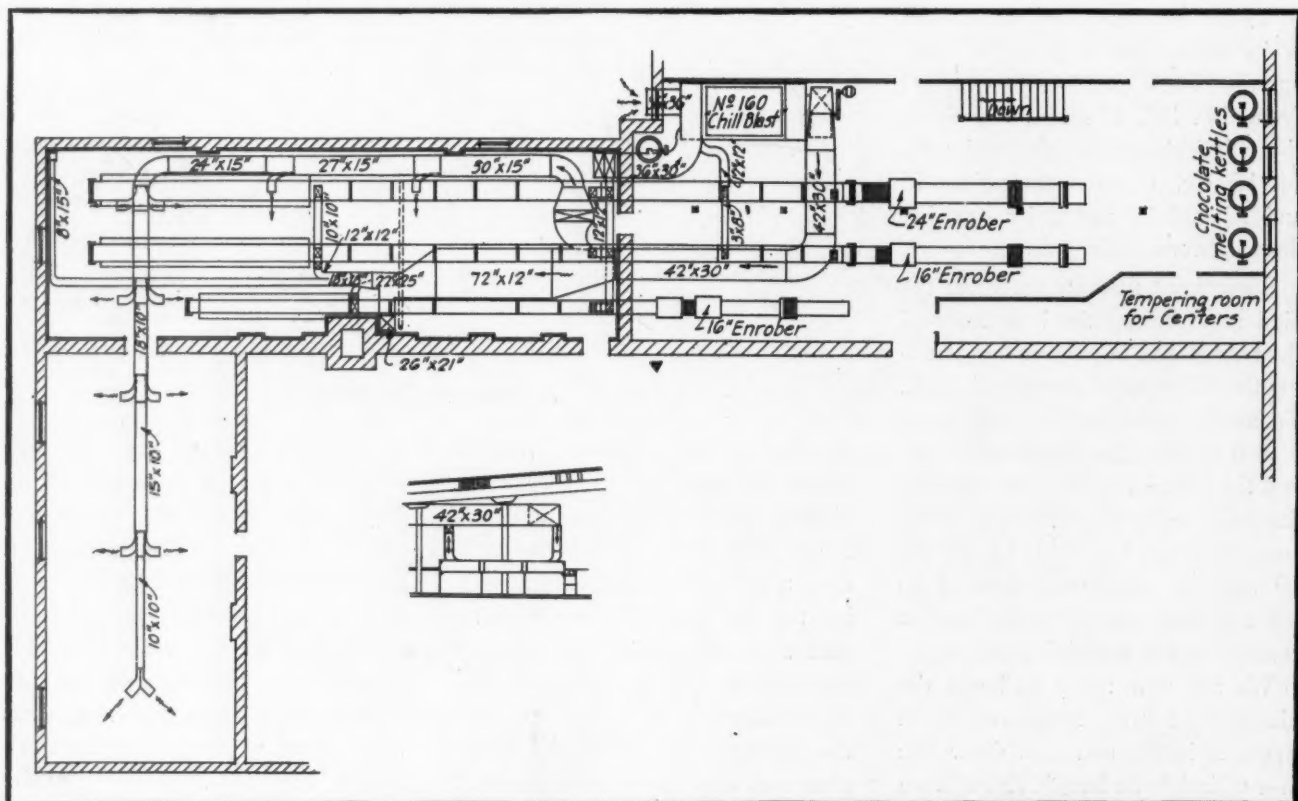
One of his jobs which entailed some very nice calculations in air movement and warm and cool air handling and at the same time required some of the most difficult working conditions of any job we have encountered lately was recently installed in a candy company plant in Fort Wayne.

The factory building is three floors high and every floor has its special departments, with requirements entirely different from the conditions on adjoining floors. The system designed and installed handles warmed air for part of the

process of making candy and for heating and chilled air for some other parts. In addition, ventilation is taken care of and just the right air conditions are furnished for the various processes of making and shipping candy.

For the benefit of those readers who eat, but have never seen candy making, we will explain a few details. The candy made in this particular plant is both the popular candy bars and also fine boxed candy. But both varieties require the same treatment. First the centers are mixed and cooked and formed into shape.

The centers are then placed on a belt which carries them through a chilling system which makes the

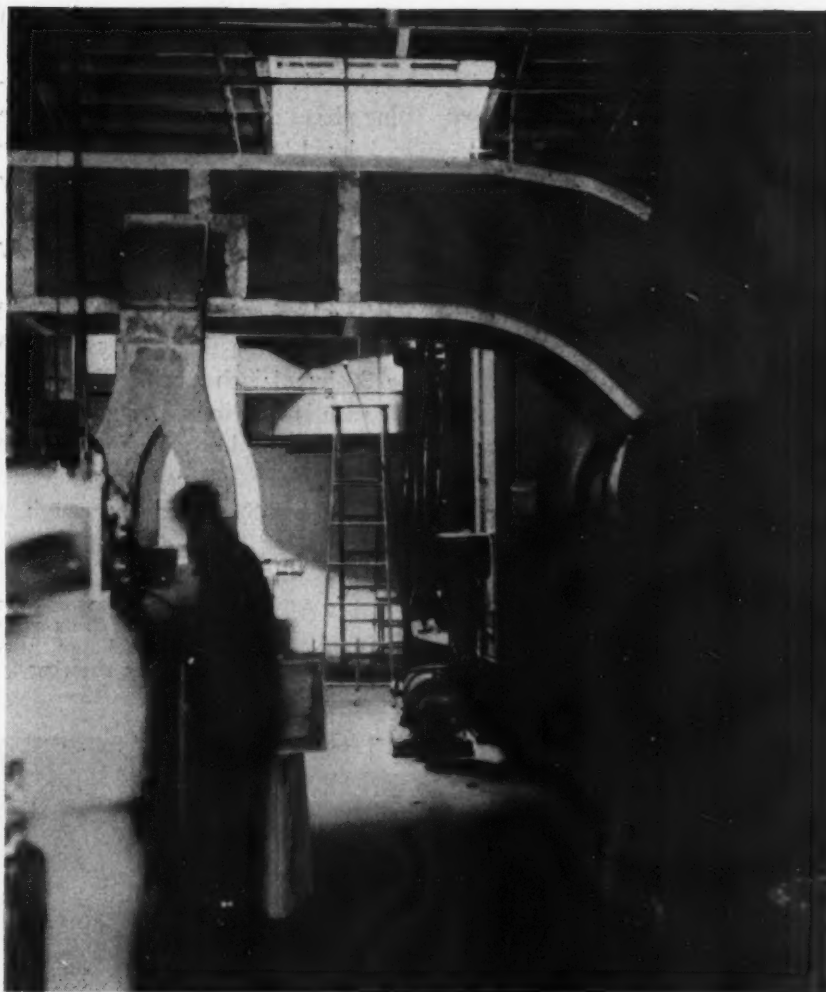


This is the layout of the second floor system. Air movements are indicated by arrows. The system is so designed that either warmed or chilled air can be fed into the rooms so that inside conditions will always be ideal for candy making

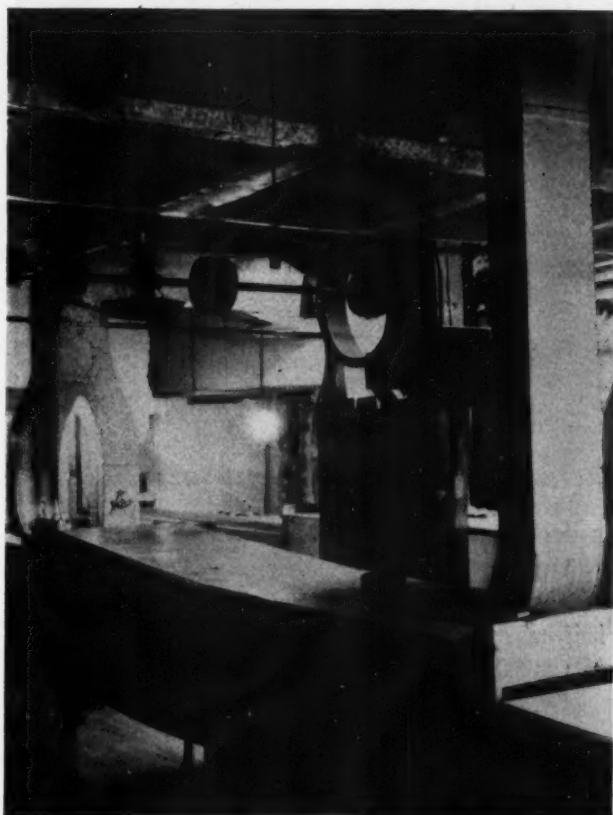
formed centers stiff enough to retain their shape. The centers then are coated with chocolate, nuts or other tasties. Both hand and machine coating is used in this plant. The machine which coats the bars is called an enrober and this shows in one of the drawings. Just as soon as the hot covering is applied the bars are subjected to cooling in order that they will retain their shape and also so that they may be packed and shipped as quickly as possible.

A good idea of the general layout can be read off the drawings. In the first place there are two distinct parts to the layout—first, a system which carries the chilled air and second the system which handles the warmed air for heating and conditioning the candy. The heart of the system is the large fan which moves the air through the chill blast room.

By looking at the second floor plan the layout of the chilled air system can be followed. Air is brought into the chill blast room from the third floor through the stacks shown. A small lead also brings hot air from over the en-



The chill blast room and fan are at the right. The main duct crosses the picture. It is encased in insulating board to conserve the condition of the air



From the main duct these crotched ducts are taken off to bring the chilled air right down over the belt on which the candy is moving. By the time the candy has left the enrober it is just right for the next operation

rober lines just beside the partition which divides the floor into two rooms. From these two sources the air is taken to a connection just outside the blast room. Here a 36 by 36-inch duct opens into the outside air. This connection with the outside serves to temper and freshen the air entering the blast room. It also serves to reinvigorate the air which otherwise would contain too much of the warm and odor laden air of the inside of the plant.

The large fan then draws the air through the chilling room and forces the chilled air through an elaborate duct system. All of this system is flat duct work hung up against the ceiling of the room. The first section of the main line as it leaves the fan is 42 by 30 inches in size. Just stop here to look at one of the pictures. This shows this main lead as it comes off the fan. You can see that this duct is covered with insulating fibre. This was put on some time after the ducts



were installed. The reason for the application was conservation of the cool air since this cold air going through warm rooms took on heat units rapidly under the warm conditions prevailing in the main room. The pieces of insulating material were cut right on the job and applied. It will be noted that the pieces are held in place by strips of sheet metal forming bands along the edges and across the faces.

Just a few feet off the fan the line takes a right angle turn down the long dimension of the room. But before the chilled air gets

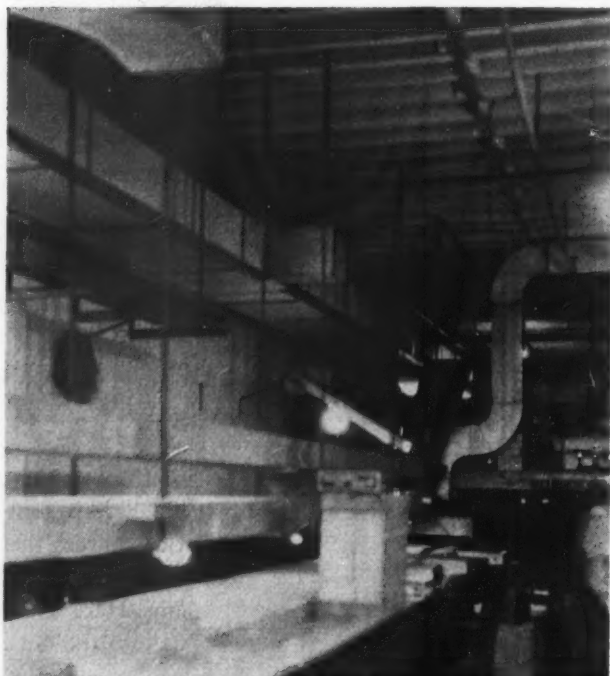
of machinery in the second room which had to be passed over.

At this point one of the interesting pieces of duct work occurs. The 72 by 12-duct is split into three branches. This is accomplished by first changing the dimensions of the duct from 72 by 12 inches to 22 by 25 and then making the triple split.

The largest branch turns left and ascends to the third floor through a 26 by 21-inch stack. The center branch is split in two, one lead running straight down the room to the end where it follows along the wall to the building corner through a

At this part of the belt the final coatings and hand operations are made on the candy and the candy must be cooled again before it is packed. This lead is 10 by 10 inches.

Now lets go back to the first change in the main line. At this point we can see that a lead is taken off at right angles and connected into a unit heater. This heater is placed in a long duct which follows the outside wall through a series of reductions with a lead coming off at each reduction. This duct carries warm or cool air to parts of the work room. The tempered air is blown out into the room so that the temperature can be lowered below what it would be were no chilling air put into the rooms filled



Left—One of the heating ducts with its discharge nozzles showing

away a pair of small leads are taken off the line and run to the hood just down the line from the enrober. As the candy leaves the enrober it is hot and the quicker the candy is cooled the faster the line can travel. So by introducing a lead from the chill line the production is speeded up. These small ducts show in one of the pictures as rectangular leads branching into a double duct just over the belt.

Just after the main line passes through the partition wall a decided change occurs in the line's construction. The depth of the duct is reduced to 12 inches and the width is increased to 72 inches. This change is due to the presence

This duct line can be used to introduce either warmed or chilled air into the packing room. This insures good working conditions and fresh candy

8 by 15 inch duct. At the end of the line the air is blown out into the room to control the air condition at the end of the belt or where the candy reaches the packing room.

The third branch is carried over the candy belts and down to the hood built over the enrober line.

with ovens and hot materials or in cold weather can be heated and introduced as warm air heat.

Nearly at the end of the room the line turns left and passes down the center of the packing room. This is plainly shown in the drawing and also in one of the photographs. The line is opened at in-

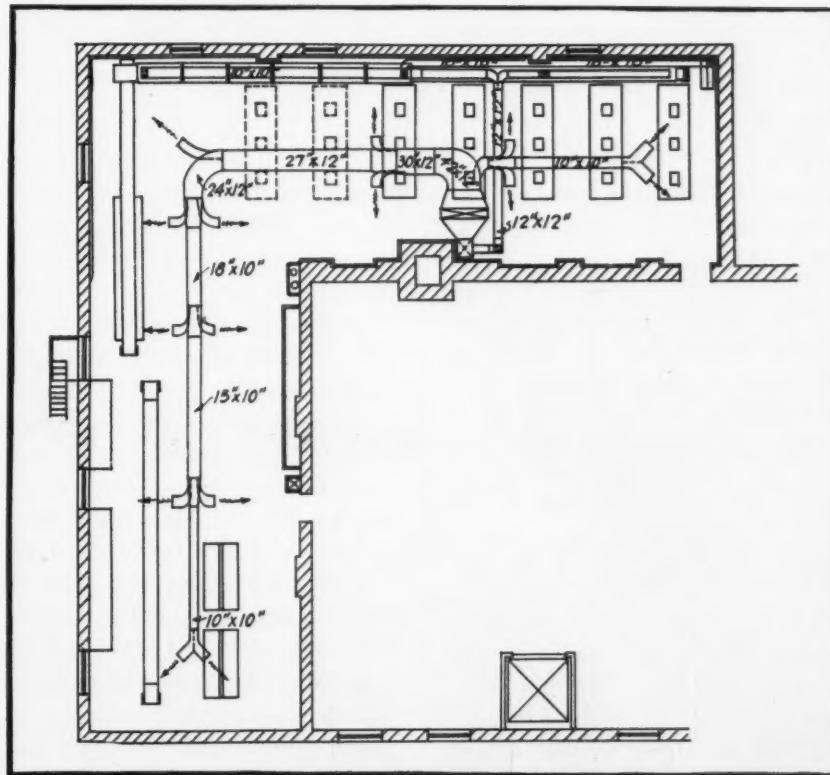


tervals and stub elbows guide the air out into the room. The end of the line is a Y branch. The sizes of the reductions are shown.

This double service line is one of the features of the installation. As the weather demands the system can be made to carry warm air or chilled air throughout the working rooms. This permits the company to accurately control inside working conditions all during the year regardless of what the weather outside may be.

The small detail on the drawing shows the construction of one of the enrobers and its connecting ducts. The chilled air is introduced into the hood at the upper end of the belt and the warmed air is taken out of the enrober at the lower end. This exhaust duct connects into the intake side of the chill blast room lead.

The third floor system is very much like that of the second floor, except that no separate chill blast room is used. The 26 by 21-inch lead from the second floor comes up along an inside partition wall, and is hooked into another unit heater. From the heater a double duct is taken off. One branch is much larger than the second. This large duct is 42 by 12 inches and runs down the center of room and turns at right angles and passes down the center of the third floor packing room. The smaller branch also passes down the center of the room in the other direction.



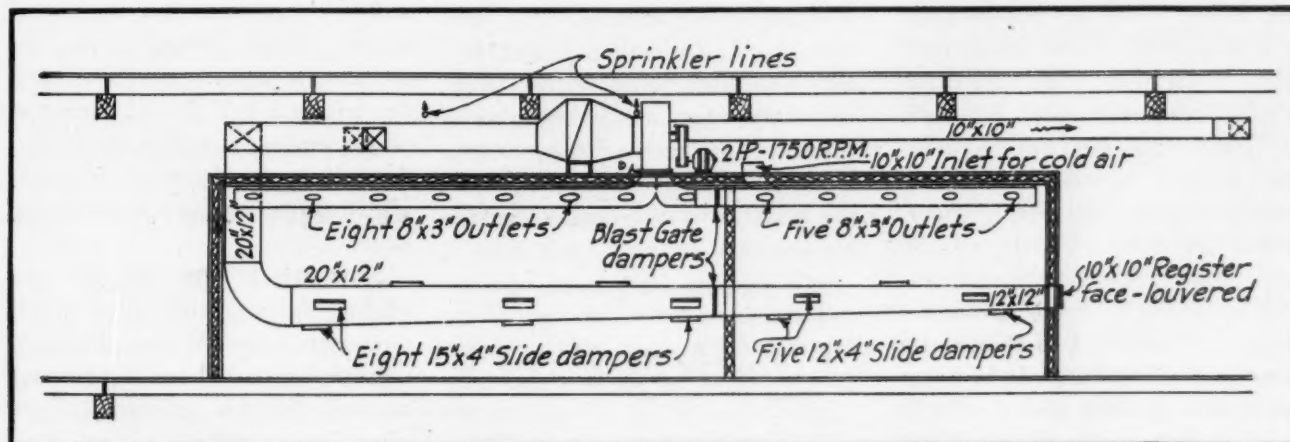
The third floor system. The main pressure line comes up from the floor below. The unit heater is used to change the chilled air to warm air as required

The large duct reduces in size right down the line as double stubs are taken off. The sizes of these outlets are shown on the plan drawing. Only two stubs are taken off the smaller branch before the end. In both branches the end of the line is a Y outlet.

As in the second floor line, either cooled air or warmed air can be introduced into the rooms. In warm weather the chill blast room serves to reduce the temperatures, while in cold weather the unit heaters are started and warm air is

blown into the rooms, but not into the enrobers, which always are furnished with chilled air.

One of the most interesting features of the job is the work done in the airtight oven room. The system here is complete in itself. One of the drawings shows the layout for this oven. Against the back wall a duct and moving slide dampers carries odors and heat laden air with a controlled amount of outside air through a graduated duct up through the ceiling of the oven, through a unit heater and a fan.



This is the layout of the oven. The unit heater and the fan are on top of the structure. The air flows into and out of the chamber through the ducts shown

The air is heated in the unit heater and forced back into the oven.

The heated air is introduced at the ceiling level through another duct provided with oval shaped openings. This duct is a two-way lead coming off the fan. The drawing shows the sizes of these ducts.

The sheet metal used all through the systems is galvanized iron covered in places as noted. The gauge of the iron varied from 28 to 18 according to the size of the ducts. American Sirroco fans were used throughout. Aerofin unit heaters were used.

The installing of the system was by far the most difficult part of the job. It took some three months to design and install the job. The contract specified that the work was to be done without interrupting the operations of the departments in the plant. In order to comply with this specification Mr. Rundell had to do a large part of his work at night and on holidays.

The system was designed on the job. No small task was it to lay out the ducts so as to pass around and over and through the large amount of machinery located in the plant. As the sections were laid out on the job the patterns were taken over to the shop and the sheets cut and fit. The cut sheets were then taken back to the job and erected. In order to save the cost of overtime work as much of the work as possible was done while the plant was operating.

An interesting feature of the new system is the fact that with the installing of the system almost one-half of the floor space originally used by the machinery was done away with. This shows in the drawings as areas of floor without any machinery and without the conditioned air system. So far as the owners are concerned the new system has enabled them to reduce the floor area used and so shorten up their production lines. It has also given them absolute control of both machine and room air conditions with subsequent increased production and increased efficiency.

## CHRYSLER BUILDING

(Continued from page 24)

if you haven't seen it yet.

There isn't much use describing the details of this figure, for it was designed and modeled and formed in metal just as the other figures were. You can look closely at the picture and figure out just where the seams come, where the sections were soldered and you can see the rivets and bolts. The bolts, like the rivets, cost some three cents and one-half each so you can count some little cost by counting the rivets down that big seam between the ruff and the neck. Also the workmen didn't get the habit of throwing bolts around for fun.

There's eight of these heads around the 61st floor and from below they look at they do in our full length view. Again we can't give

the connection between the ornament and the corporation, but at least the heads are very interesting pieces of sheet metal work. A lot of shops would like to have those eight heads to work on during slack seasons, eh?

## FURNACE-COAL CONFERENCE

(Continued from page 31)

cational work. We have manuals which we distribute, but I don't know how extensively they are used. The feeling of the coal man today toward the automatic stoker is friendly, and he would like to see it move forward. Why can't the stoker manufacturer and the furnace manufacturer include the sale of the stoker within the furnace? That would reduce the price of the equipment.

# Here's One for You Trouble Shooters

**W**E have just been presented with a difficult ventilating problem. It has to do with the ventilating methods used to remove heat from industrial buildings having monitors and sawtooth roofs.

The reader sending in this problem says that he wants to find enough data so that he can go out and sell ventilating to manufacturers who are building new or remodeling their buildings. He not only wants information on ventilating, but wants to go farther back into the problem and get enough information so that he can go to the architect or engineer in charge of the work and make a case out for his services.

He puts the proposition to us like this—

1. What is the best way to handle heat removal?

2. How about monitor construction? Is this a good way to handle heat removal? If it is, where does

the sheet metal contractor get off? If, on the other hand, ventilators are better, why are they better? What can the sheet metal man say to prove it?

3. How about sawtooth construction?

4. If there is something to be said in favor of ventilators, how can the contractor who wants to see this work retained in the sheet metal field go about it to see that it is kept there? What can he say about new construction and who can he say it to? Is there any use of his wasting any time on a prospect where they have an old building already equipped with operating sash?

Now we propose to give you readers plenty of time to think this one over. Consult your files and old sales talks and see if you have answers for his problem. Then send them in and we will see if we can't get out some information of value.



**AN UNUSUAL TWO-WAY Y***(Continued from page 37)*

20-1 on the plan on line *m-n* numbering it 20-1° and connect points 20°-1°. The true length of the seam line 13-1 is the same as line 13°-1. This completes the diagram of lines.

We are now ready to begin the development of the pattern. From the diagram of lines take the distance 13°-1 and place it at an angle as shown in Figure 2. Then using the distance 13°-10 as a radius and 13° as a center, strike an arc and with the distance 1-10 taken from the plan, with 1 as a center, strike an arc intersecting the arc already drawn, locating point 10. Now from diagram of lines take distance 14°-10 and with 10 as a center strike an arc, and intersect this arc with another one using 13-14 on the half profile in the elevation as a radius, with 13° as a center. Next take distance 14°-11 from the diagram of lines and with 14° as a center strike an arc, and intersect this arc with another, using the distance 10-11 found on the plan as a radius, with 20 as a center. This locates point 11. Continue in this manner until line 16°-6° is used. Now with distance 6°-17° in the true length lines strike an arc with 6 as a center and intersect this arc with another, using the distance 16-17 found on the half profile as a radius, with 16 as a center. Now with distance 17°-5 in the true length lines strike an arc with 17° as a center, and intersect this arc with another, using the distance 6-5 found on the true section on A-B as a radius, with 6 as a center. Continue as in the first half of the pattern except that the points 5, 4, 3, etc., are located on the pattern by using distances 6-5, 5-4, etc., on the true section on A-B instead of similarly numbered points on the plan. This is done because those points on the plan do not show a true section. Continue to the seam line, then use the distance 13°-1, as in the beginning. Connect the vari-

ous points located, as shown, thus completing the pattern. Add seam allowance on both pieces, and a lap along the edge 6-5-4, etc., to 1, on one of the prongs only.

**15-YEAR OLD CORNICE ERROR***(Continued from page 35)*

Kansas City, were awarded the job of putting the cornice up. Copper was specified and an attractive design made in metal. So quietly was the four weeks' job carried out that few of the thousands of persons passing below were even aware that a job was going on over their heads. No barricade was used on the sidewalk, but insurance against falling materials was made assured by using a guard around the scaffolding on which the Zahner company's men worked.

As sections of the old cornice were removed the exposed framework had to be altered to take the new metal cornice. The heavy structural supports were cut away, leaving one large channel beam on which to bolt the new cornice.

The new cornice was fastened to this channel by long brass bolts. As can be seen in the picture, the new cornice extends from the outside edge of the gutter down to an ornamental belt course of terra cotta. This belt course has no projection, so that the new cornice is the only part of the building which now projects over the face of the hotel.

In this job some 380 lineal feet of new cornice was applied.

A feature of the new cornice is the color. The trim of the building is white and it was required of the metal contractor that the new cornice match the old trim. The copper was therefore painted white.

While the job was under way the Advance Sheet Metal Club of Kansas City prepared and published in a Kansas City paper an advertisement calling attention to the work and making use of the replacement to call attention of architects and potential buyers of metal work to the dangers of heavy cornices and

the safety, long life, and attractiveness of metal cornices.

**FLOOR DRAFT PROBLEM***(Continued from page 34)*

taken."

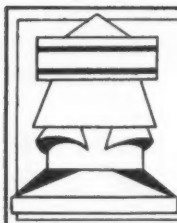
It seems to us that Mr. Voorhees has done a remarkably good piece of work in calling our attention to some of the things we too frequently overlook. His practical experience ought to serve as a reminder that mere solution, as he states, is not always enough and that we ought to HAVE REASONS FOR THE THINGS WE DO.

We also feel that there is a point to Mr. Voorhees' letter that is worth using. That point is the ADVERTISING VALUE of an inspection system such as he describes. Just suppose for a minute that you had been called in to remedy the complaint stated in our problem. One contractor might walk in, look around and remark, "Sure I can fix it, you haven't enough cold air." Or he might offer some similar solution.

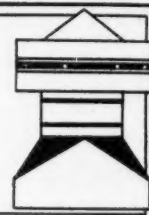
Then you enter the house. You test the temperature of the warm air as it comes from the register. You use an instrument which any householder can tell is a delicate and expensive instrument. Then you test the air currents by the ammonium chloride fumes. That test is good enough to stop traffic in front of any store window. And it certainly should boost your standing as a scientific heating man to any home owner.

You end your tests by determining just how the cold air side of the system is working. Then you tell the owner what is wrong and suggest your remedy. Does he believe your analysis over that of the test by sight heating man. You answer that one for yourself.

And by all means don't forget—**THAT KIND OF A SALES TALK GETS THE PROFITS.** You ought to be able to sell a job on that basis at your own price.



# GRAVITY EXHAUST VENTILATION



## Another Solution for That Window Sweating Problem

IN the issue of April 26 we presented a problem in ventilating in which excess moisture or sweating of windows in a store building had been sent in for assistance by one of our readers. As the problem was received the de-

to anything.

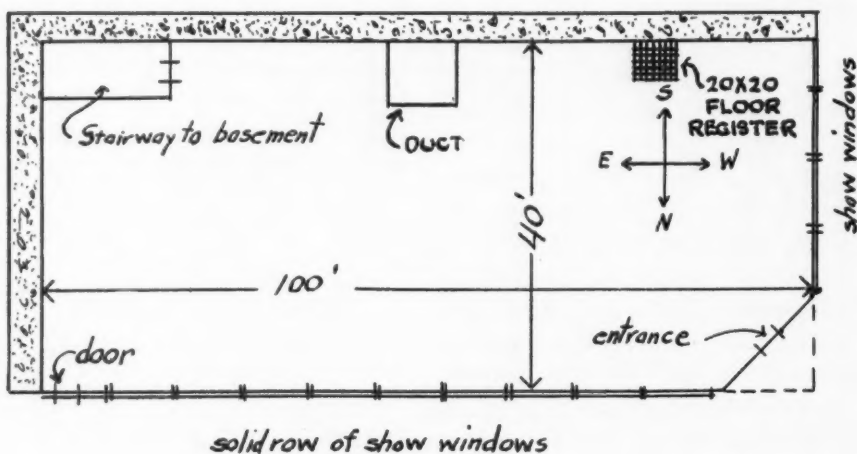
The owner wants to know whether or not ventilation will solve his problem. The heat is *insufficient* as it is, but there is a hot water coil in the basement from which the heat is now wasted. How

will *ventilation* affect the heating? Can the waste heat from the hot water coil be used?

The presentation of the problem was followed in the May 24 issue by a solution worked out by Paul Jordan. This solution showed how the difficulty could be overcome through the use of a ventilator and connecting ducts drawing air from the first floor.

Now we have another solution sent in by Ed Kunold of Aurora, Illinois, who also worked out a very efficient solution for the floor draft problem which we ran last month. Mr. Kunold works out the solution as follows:

"First, I believe that the condition responsible for the whole trouble is the lack of circulation of cold air. Also, the warm air has no chance to mix or circulate. With so much glass exposed and with no cold air taken out of the building, there is sure to be con-



STORE FLOOR PLAN

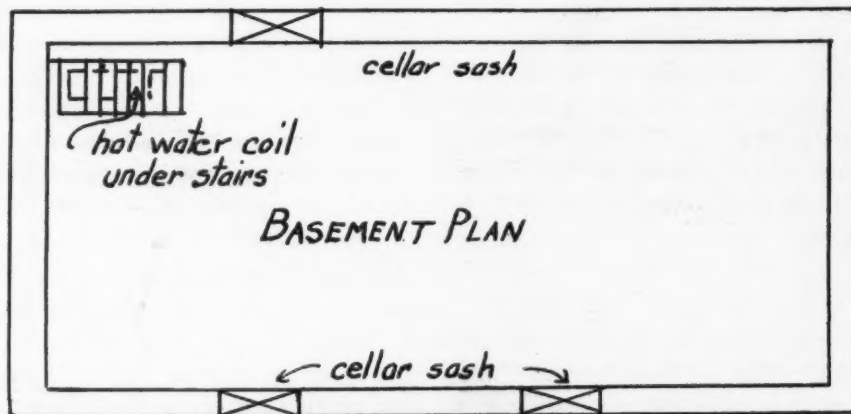
This shows the floor plan of the first floor. Both the front and the long side are solid rows of large show windows which extend from 12 inches above the first floor to within 24 inches of the ceiling. Fixed transoms are above the windows

tails were as follows:

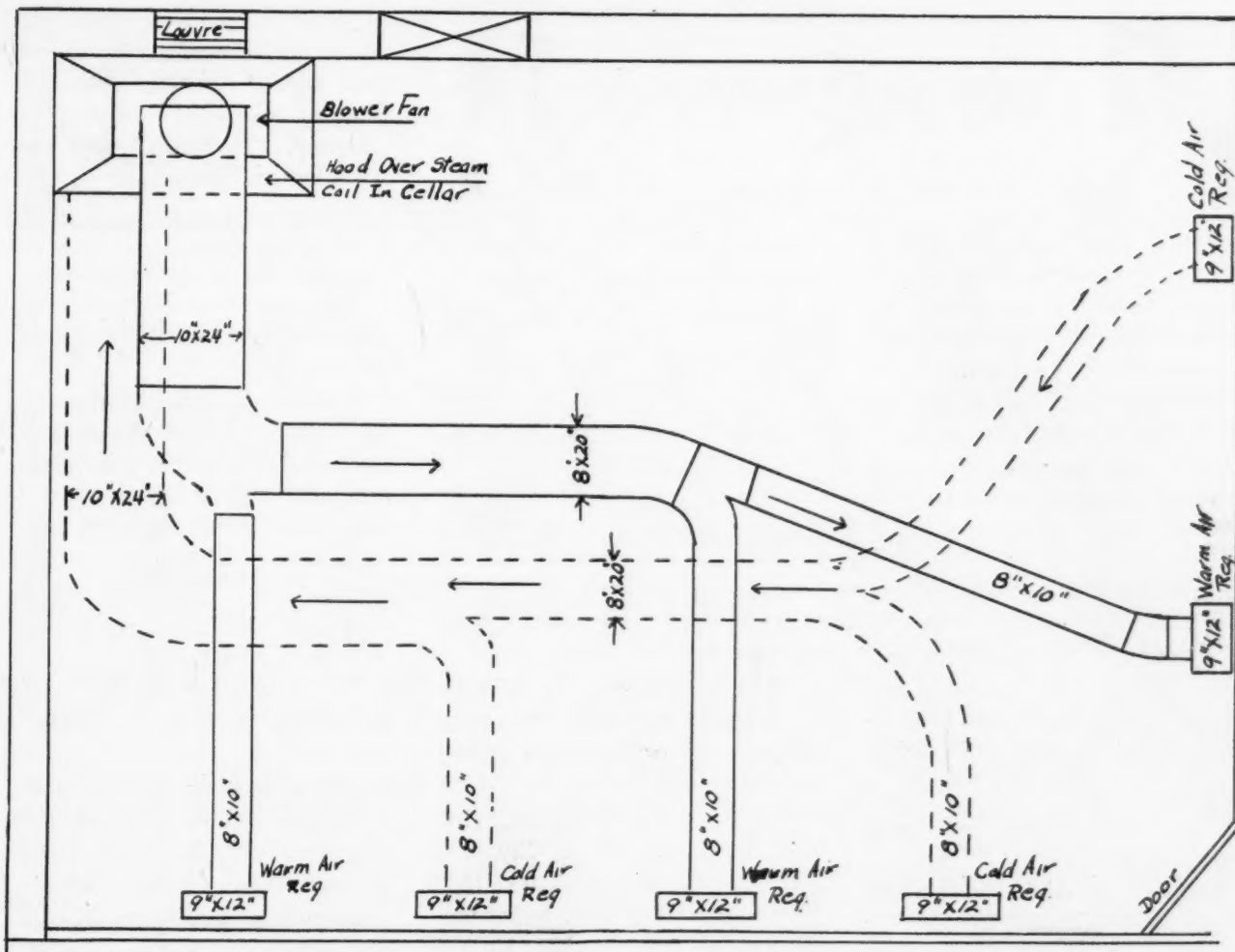
The building is on a southeast corner, the north and west sides facing intersecting streets, and being solid show windows of plate glass running from 12 inches above the floor to 24 inches below the ceiling. Above the show windows are glass fixed transoms.

These windows sweat so badly that water runs down onto the floor. That is what the owner wants to cure.

The building is one-story with basement. No roof space to amount



This is the floor plan of the basement. Three windows placed high above the basement floor provide light and air. The only other opening is the stair well which is enclosed in a small room on the first floor. The hot water coil stands well under the stairs. The foundation walls are all concrete. So is the floor



This drawing shows how Mr. Kunold would overcome the window sweating nuisance. The layout should be efficient and should make a nice job for the ventilation contractor

densation.

"In Mr. Jordan's reply to question number 6 he says that the hot water coil in the cellar can not be hooded over to furnish heat for the first floor, but in question 7 you say that on the other hand, the coil may be used to temper the outside air that may be taken into the basement.

"Now if cold air can be taken from inside the first floor store and forced or drawn through a casing around the coil and returned up by trunk line to the first floor again the effect should be the same as though cold air was taken from the outside and tempered. The only trouble would be that you would then have too much dead cold air inside the building.

"I believe that by placing a blower of the proper size in the top of the hood over the coil and drawing the cold air down and replacing

this cold air with warm air the system should work to a T.

"I also believe that an automatic louver placed in the wall of the cellar opening and connected into the casing around the hot water coil with the louvres to the inside would let in enough cold air from the outside. While this is not absolutely necessary, it would be of great assistance in overcoming the trouble.

"The main thing, I believe, is to get the cold air into circulation. Perhaps my pipe sizes are too small, but with an installation such as I have in mind and which is shown on the drawing I am sending in, I feel sure this lack of cold air circulation will be overcome. In my plan, the cold air is taken into the bottom of the casing built around the coil and by means of the blower is forced out as warm air from the top. It is then blown into the first floor.

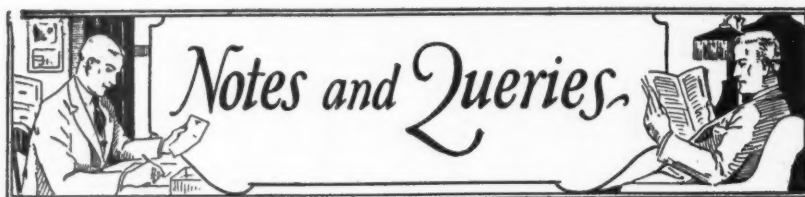
"This plan ought to overcome the condensation which I believe is due to the dead cold air in the first floor store.

"If the owner does not care to go to the expense of building and installing the casing and duct work shown, he can have three or four stacks run up the south and west walls and connect to a good ventilator on the upper end. The ventilators selected should have good pulling power.

"If the louvres are not used, the blower should be placed in the cold air duct, right next to the coil casing."

This system of Mr. Kunold's is somewhat more elaborate than Mr. Jordan's system, but it seems to us that it ought to overcome the trouble nicely. You readers can also take this plan apart if you want to.





**"Will B. Lane" Socket Wrenches**

From C. R. Gleich, Nokomis, Illinois.

Can you tell me who makes the "Will B. Lane" socket wrenches?

Ans.—Will B. Lane Unique Tool Company, 422 South Dearborn Street, Chicago, Illinois.

**Oil Can Spouts**

From Scott Sheet Metal Works, Colorado, Texas.

Please give me the name of a firm that makes oil can spouts.

Ans.—American Can Company, 104 South Michigan Avenue, Chicago.

**"Brotts" Wire Eaves Trough Hangers**  
From Hammond Sheet Metal Company, Second and Cass Avenue, St. Louis, Missouri.

Who makes "Brotts" wire eaves trough hangers?

Ans.—Z. H. Held, 929 South Maple Street, Ottawa, Illinois.

**Who Makes "Goodwin's" Stage Ventilator?**

From Townley Metal and Hardware Company, 200 Walnut Street, Kansas City, Missouri.

Can you tell us who makes the Goodwin's stage ventilator?

*Subscribers:* Can you help a fellow reader?

**"New Marvel" Soldering Iron**

From Reckmeyer Hardware Company, Arlington, Nebraska.

Please advise us who makes the "New Marvel" self-heating soldering iron.

Ans.—This iron was made by Lyon, Conklin and Company, Baltimore, Maryland, who have discontinued its manufacture.

**Address of Turner Brass Works**

From Chappell Plumbing and Heating Company, Chappell, Nebraska.

Where is the Turner Brass Company located?

Ans.—Sycamore, Illinois.

**Address of Barlow and Seelig Mfg. Co.**  
From Henry Kesler, El Paso, Illinois.

Can you furnish me with the address of the Barlow and Seelig

Manufacturing Company, makers of washing machines?

Ans.—Ripon, Wisconsin.

**"Allsteel" Paper Baler**

From J. T. McArdle, 522 East 24th Street, Indianapolis, Indiana.

Please inform me who makes the "Allsteel" paper baler.

Ans.—Economy Baler Company, Department BM, Ann Arbor, Michigan.

**Register Shields and Filters**

From E. R. Basye, Box 394, Oberlin, Kansas.

Please tell me who makes register shields and filters for keeping the dust and smoke from coming into the room.

Ans.—Beh and Company, 1140 Broadway, New York City, and Hall-Neal Furnace Company, 1322 North Capitol Avenue, Indianapolis, Indiana, make register shields. Tuttle Register Dust Catcher Company, 114 East Chestnut Street, Louisville, Kentucky, make register filters.

**Incinerators**

From Moser Brothers, Sabetha, Kansas.

Who makes a gas fired incinerator—one for basement use that can be connected to furnace flue?

Ans.—Kerner Incinerator Company, 612 North Michigan Avenue, and Mid-West Incinerator Corporation, 154 East Erie Street; both of Chicago, Illinois.

**Steel Wool for Air Filters**

From Dowagiac Steel Furnace Company, Dowagiac, Michigan.

We would appreciate receiving a list of companies that manufacture steel wool to use with air filters.

Ans.—American Steel Wool Manufacturing Company, 9 Desbrosses, New York City; Galvain Brothers Steel Wool and Manufacturing Company, 445 Baxter Avenue, Louisville, Kentucky; International Nickel Company, Inc.,

67 Wall Street, New York City (monel metal wool); International Steel Wool Company, Springfield, Ohio, and James H. Rhodes and Company, 157 West Austin Avenue, Chicago, Illinois.

**Hose for Furnace Cleaners**

From Beaver Sheet Metal Company, Beaver Dam, Wisconsin.

Please advise us who makes 6-inch flexible hose for furnace cleaners.

Ans.—W. D. Allen Manufacturing Company, 566 West Lake Street, and United States Rubber Company, 428 West Washington Street; both of Chicago, Illinois.

**Tinning Flux**

From Standard Furnace and Supply Company, 407 South Tenth Street, Omaha, Nebraska.

We should like to know who makes tinning flux for retinning milk cans.

Ans.—The L. B. Allen Company, Inc., 6727 Bryn Mawr Avenue, Chicago, Illinois, and Ruby Chemical Company, Columbus, Ohio.

**Nested Pipe Power Lock Machine**

From Marshall Furnace Company, Marshall, Michigan.

Do you know of any one manufacturing a nested pipe power lock machine?

Ans.—The Peck, Stow and Wilcox Company, Southington, Connecticut, whose distributors in this territory are Interstate Machinery Company, 601 West Monroe Street, Chicago, Illinois.

**Who Makes "Martin" Cistern Filter?**  
From E. L. Hyre, Saybrook, Illinois.

Can you tell me who makes the "Martin" cistern filter. This is a device for filtering cistern water, being attached to the lower end of the suction pipe. I think that it is made some place in Iowa, but am not sure.

*Readers*—Can you supply this information?

**Address of Chandler Pump Company**  
From International Heater Company, 1933 Wentworth Avenue, Chicago, Illinois.

Please tell us where the Chandler Pump Company is located.

Ans.—Cedar Rapids, Iowa.



## ASSOCIATION ACTIVITIES

### **Ladies Auxiliary, National Assn. Sheet Metal Contractors, Wants Auxiliary Members to Attend National Meeting**

We publish here the letter now being mailed to all members of the Ladies' Auxiliary, National Association of Sheet Metal Contractors. Dear Auxiliary Member:—

This letter conveys to you an invitation to attend the 26th Annual Convention of the National Association of Sheet Metal Contractors which will be held this year at Pittsburgh, Pennsylvania, June 10-14.

Let's all get together again and show the boys we are with them. Our auxiliary has gone too far to back-track now, so let's start up hill and see what's on the other side.

All hats off to the Baltimore Auxiliary for the splendid organization they have. Great work has been accomplished by them during the past year and we are proud of them.

After all, it's your auxiliary and you have invested your money and personality in it. Now is the time to take the fine nucleus which we have and weld it into a machine which will function smoothly from now on out.

If you have not as yet sent in your dues for 1929, please send them in at once to our National Treasurer, Miss Irene S. Fingles.

It is our sincere hope that you will accept this invitation in the same spirit of good will with which it is extended and that we shall have the pleasure of greeting each other at Pittsburgh, but until then, we are,

Yours very truly,  
(Signed) Mary A. O'Leary,  
President.

### **Kentucky S. M. & R. C. Assn. Holds Meeting and Elects Officers**

Twenty-three members of the Association met at the French Village about 6:00. At 7:45 Mr. Ankerman called the meeting to order and asked Mr. Jackson to act as his spokesman. The minutes of the previous meeting were not read and the roll was not called.

Jake Bailen opened the subject of delegates and it was distinctly understood that the state was entitled to one delegate and one alternate from members out in the state. Ben Hurst was nominated as delegate and Mr. Mattingly as alternate. Mr. Hurley addressed the meeting in behalf of the Louisville Convention and Publicity League. He encouraged the men to have the National Convention at Louisville again.

The election of officers was gone through with quite a bit of spirit. Mr. Fink was nominated for president and unanimously elected. Mr. Bailen was nominated for first vice-president and unanimously elected. Mr. Goodin was nominated for second vice-president and unanimously elected. Winston Johnson was nominated for secretary and unanimously elected. Lee Harping was nominated for treasurer and unanimously elected. Mr. Zellar was nominated as sergeant at arms and unanimously elected.

### **Baltimore S. M. & R. C. Assn. Elects Officers for New Fiscal Year**

The Sheet Metal and Roofing Contractors Association of Baltimore have just held their regular monthly meeting last week. This meeting being the end of the fiscal year, the election of officers for the ensuing year was held. John O. White and

Charles E. Brandt were re-elected president and vice-president respectively. Robert N. Francis was elected secretary and treasurer, serving in the dual capacity. He succeeded Mr. Hiss, who resigned previously, owing to his employer retiring from business and Mr. Ward, our former treasurer for a number of years.

The delegates to attend the National Convention at Pittsburgh, Pa., were also elected at this meeting. They are W. A. Fingles, Sr., Wm. F. Zellar, Roy Danzer. Alternates are John O. White, James A. Haley, Joseph L. Hagger.

The Ladies' Auxiliary of the Sheet Metal & Roofing Contractors Association held a benefit card party during the month at the Gray Goose Inn, clearing approximately \$100.00. Mrs. Baehr served as chairman of the arrangement committee. Refreshments were served and the usual prizes offered. The officers are President, Mrs. F. H. Baehr; Treasurer, Miss Irene Fingles, and Secretary, Mrs. E. J. Ward.

### **Lafayette District, Indiana S. M. & W. A. H. Assn. Announces Meeting**

District Governor Louis Lehen of the Lafayette District announces that the district meeting scheduled for Friday, June 20th, will be held at Lafayette at Lincoln Lodge. The dinner will be a fish fry. The meeting is sponsored by the State Association, but is open to all elements of the trade, including non-member and member contractors, jobbers, salesmen, manufacturers and manufacturers' representatives. The meeting will be purely social, the purpose being to promote good will among the various elements of the trade.

# NEW ITEMS *and* NEWS ITEMS

## *From and about the Manufacturers and Jobbers*

### Richardson & Boynton Bowling Team Gets Hot and Challenges All Comers

Members of the Richardson & Boynton organization diverted their interest from furnaces to bowlers for a period of several days last month during which the alleys in several cities were the arenas for heated inter-departmental bowling contests.

Spurred on by prizes offered for every conceivable bowling score, from the highest to the lowest for both teams and individuals, combinations were chosen to represent the plants, the branch offices and the executive division.

When the smoke of many battles in many different places had cleared away statistics showed that the team representing the Utica general office had high honors and the first prize.

Individual honors for high average of three games went to Urtz of Utica with an average of 200 and Longstreet with an average of 191. Individual honors for high score in one game were won by Hammes, Utica General, 246; Urtz, Utica General, 220; Longstreet, New York Executive, 211, and Lange, Chicago Branch, 210.

With such scores as a matter of attested record, the courage of these R. & B. bowlers has reached such heights of confidence as to induce them to look afield for new worlds to conquer, even to a point of looking favorably upon any challenge that might come from a team representing any other recognized organization manufacturing heating equipment, here or elsewhere, now or at any future time. Such as can muster the necessary courage to accept this challenge should communicate at once with the Richardson & Boynton Company, 260 Fifth Avenue, New York.

### Warm Air Furnace Fan Co. Announces a New Blower

The Warm Air Furnace Fan Company of Cleveland announces the production of a new blower to be called the Miles Blower.

The new blower, like all the company's products, is furnished with by-pass louvers. The new blower was designed especially for air conditioning work.

The features of the new unit are: Double inlet, double width fan unit with low tip speed, low outlet ve-

circulate for gravity heating service.

The wide range in winter temperatures necessitates a wide range in heating capacities which are not possible with an on and off system. The by-pass principle insures air conditioning service at all times. The gravity system reduces the capacity of the heating unit to correspond with the decreased heating requirement, and will hold the temperature for an extended period even in very cold weather.

### J. M. & L. A. Osborn Co. Take Over Part of Republic Metalware Co.

The J. M. & L. A. Osborn Company announces through A. W. Howe, president, that it has taken over and acquired the stock, good-mill and assets of that part of the Republic Metalware Company's business dealing with the jobbing and warehousing of sheet metal and accessories at Buffalo, N. Y.

It is understood that Republic, which has been a jobber of sheet metal for many years, will step out of that field in the Buffalo district, but their New York and Chicago branches will be continued.

Mr. Howe and Clayton A. Nenno, vice president in charge of the Osborn company's Buffalo division, negotiated the deal and within the next sixty days the transfer will be completed.

### Williamson Heater Co. Moves Chicago Office

The Midwestern branch of the Williamson Heater Company, formerly located at 589 East Illinois Street, Chicago, Ill., has been moved to their own building at 1211, 13 Madison Street, Maywood, Ill.

#### DATA SHEET

##### NO 107 MILES CENTRIFUGAL FURNACE BLOWER

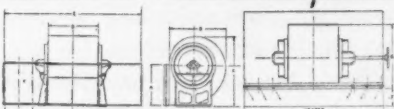
RPM	TIP SPEED	ATMOSPHERIC	1/2" STATIC	1/4" STATIC	1/8" STATIC	1/16" STATIC	GRAVITY
400	1125	1025	04	940	04		500 A
500	1407	1280	08	1175	08	1000	04
600	1690	1525	12	1410	12	1205	12
750	2110	1920	27	1750	26	1505	24
800	2420	2200	40	2020	39	1725	36
						1630	26
							500 A

##### NO 125 MILES CENTRIFUGAL FURNACE BLOWER

RPM	TIP SPEED	ATMOSPHERIC	1/2" STATIC	1/4" STATIC	1/8" STATIC	1/16" STATIC	GRAVITY
300	985	1500	07	1590	06		685 B
350	1100	1750	12	1525	09		685 B
400	1310	2000	16	1860	14	1740	12
450	1460	2250	22	2100	19	1910	16
500	1650	2500	31	2300	26	2180	22
550	1800	2750	40	2550	35	2400	30
600	1960	3000	52	2800	44	2600	36
						2300	28
							950 D

##### NO 180 MILES CENTRIFUGAL FURNACE BLOWER

RPM	TIP SPEED	ATMOSPHERIC	1/2" STATIC	1/4" STATIC	1/8" STATIC	1/16" STATIC	GRAVITY
250	1180	1500	24	2670	16	2000	14
300	1410	1750	48	4100	32	2400	16
350	1650	2000	66	4940	44	4200	32
400	1900	2250	84	5780	70	5000	64
						4200	60
						2500	30
							1360 G



DIMENSIONS IN INCHES

	A	B	C	D	E	F	G
NO. 107	11 1/2	15 1/2	17 1/2	1 1/2	39	10	17 1/2
NO. 125	15 1/2	21 1/2	25 1/2	1 1/2	47	10	23 1/2
NO. 180	18 1/2	27 1/2	31 1/2	2 1/2	54	10	29 1/2

locity for quiet operation, and wide horizontal discharge opening for even distribution through heater.

The Miles Centrifugal Furnace Fan has the Miles patented by-pass louvers on either side of the fan orifice, to provide free area for gravity flow when the fan is not running. This feature has been found desirable for air conditioning service, in that it protects the heater from damage due to careless operation, abuse, or other unavoidable causes, as well as allows the air to



# For **SECURITY**

## in fastening sheet metal to wood

**4 times  
the holding power  
of ordinary nails**

The Hardened Screwnail guarantees a secure assembly.. Use it to be sure that the sheet metal work you fasten to wood will *stay put* year in and year out.

***Will not back out—or loosen***

A hardened spiral thread which cuts into sheet metal and worms its way into wood gives the Hardened Screwnail enormous holding power—actually four times that of an ordinary nail! The Screwnail will not back out, pull out or loosen—even though subjected to severe vibration.

***Pierces sheet metal with ease***

You can drive this new Nail easier and faster, too. No need to punch a hole unless the sheet metal is very heavy. The Screwnail has a hardened needle point which pierces the metal with ease. It also has great tensile and sheer strength which overcomes trouble with bending and breaking.

We want you to know the advantages of Hardened Screwnails. Mail the coupon and we'll send a handful of Screwnails, free. A test on your own work will show you a better and easier way of fastening gutters, cornices, flashings, metal ceilings, etc., to wood.

**PARKER-KALON**  
HARDENED  
**Screwnails**

PATENTED JAN. 29, 1924—NO. 1482151 OTHER PATENTS PENDING  
TRADE MARK REG. U. S. PAT. OFF



**Drives  
like a nail**



**Holds  
like a screw**

**FREE SAMPLES**

PARKER-KALON CORPORATION, 190 Varick St., New York, N. Y.  
Send me samples of Hardened Screwnails. I want to try them for

Name .....

Address .....

Mention AMERICAN ARTISAN in your reply—Thank you!

# ~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

## METALS

### PIG IRON

Chicago Fdy.,	
No. 2	\$18.50 to \$19.00
Southern Fdy. No. 2	18.50
Lake Superior Charcoal	23.04 to 27.04
Malleable	18.50 to 19.00

### FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IO	20x28	112 sheets	\$22.50
IX	20x28	112 sheets	25.50
IXX	20x28	56 sheets	14.50
IXXX	20x28	112 sheets	15.50
IXXXX	20x28	112 sheets	17.00

### TERNE PLATES

IO	20x28, 40-lb.	112 sheets	\$25.00
IX	20x28, 40-lb.	112 sheets	27.75
IC	20x28, 25-lb.	112 sheets	21.15
IX	20x28, 25-lb.	112 sheets	23.80
IC	20x28, 20-lb.	112 sheets	19.55
IV	20x28, 20-lb.	112 sheets	22.05

### "ARMCO" INGOT IRON PLATES

No. 8 ga.	—110 lbs.	\$4.15
3/16 in.	—100 lbs.	4.05
1/4 in.	—100 lbs.	8.85

### COKE PLATES

Cokes, 80 lbs., base, 20x28	\$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, 10,	
20x28	12.75
Cokes, 135 lbs., base, 1X,	
20x28	14.75
Cokes, 155 lbs., base, 2X,	
56 sheets	8.50
Cokes, 175 lbs., base, 3X,	
56 sheets	9.35
Cokes, 195 lbs., base, 4X,	
56 sheets	10.25

### BLUE ANNEALED SHEETS

Base 10 ga.	per 100 lbs.	\$3.85
"Armco" 10 ga.	per 100 lbs.	4.15

### ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	\$3.85
No. 22	per 100 lbs.	4.00
No. 24	per 100 lbs.	4.05
No. 26	per 100 lbs.	4.15
No. 27	per 100 lbs.	4.20
No. 28	per 100 lbs.	4.30

### GALVANIZED

No. 16	per 100 lbs.	\$4.10
No. 18	per 100 lbs.	4.20
No. 20	per 100 lbs.	4.40
No. 22	per 100 lbs.	4.45
(Standard differentials on extras to apply)		
No. 24	per 100 lbs.	\$4.60
No. 26	per 100 lbs.	4.85
No. 27	per 100 lbs.	4.95
No. 28	per 100 lbs.	5.10
"Armco" 24	per 100 lbs.	6.15

### BAR SOLDER

Warranted 50-50	per 100 lbs.	\$22.50
45-55	per 100 lbs.	21.50
48-52	per 100 lbs.	20.50
Plumbers'	per 100 lbs.	18.00

### ZINC

In Slabs	\$5.50
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### SHEET ZINC

Cask Lots (600 lbs.)	\$12.00
Sheet Lots (100 lbs.)	18.00

### BRASS

Sheets, Chicago base	19 3/4 c
Tubing, brazed, Chicago base	27 3/4 c
Tubing, seamless, Chicago base	24 3/4 c
Wire, Chicago base	20 3/4 c
Rods, Chicago base	18 3/4 c

## COPPER

Sheets, Chicago base	22 3/4 c
Tubing, seamless, Chicago base	25 c
Wire, plain rd., 8 B. & S. Ga.	
and heavier	15 c

## LEAD

American Pig	\$8.50
Bar	8.50

## TIN

Bar Tin	per 100 lbs. \$39.00
Pig Tin	per 100 lbs. 38.00

## SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

## ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7 1/2 c per lb.
Mill board 3/32 to 1/4	7 1/2 c per lb.
Corrugated paper (250 sq. ft. per roll)	\$6.00 per roll

## ASBESTOS SEGMENTS

8 in.	per 100 sets \$7.30
9 in.	per 100 sets 8.30
10 in.	per 100 sets 9.30
12 in.	per 100 sets 10.50

## CEMENT FURNACE

American Seal, 5-lb. cans, net	\$0.40
American Seal, 10-lb. cans, net	0.80
American Seal, 25-lb. cans, net	2.00
Pecora	per 100 lbs. 7.50

## CLIPS

Damper	
No-Rivet Steel, with tail pieces,	
per gross	\$9.50
Rivet Steel, with tail pieces,	
per gross	7.50
Tail pieces, per gross	2.40

## COPPER FOOTING

Copper Footing	34 %
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## CORNICE BRAKES

Chicago Steel Bending	
Nos. 1 to 6B	Net

## CUT-OFFS

Cal., plain, round or cor. rd.	
26 gauge	30 %
28 gauge	35 %

## DAMPERS

Yankee Hot Air	
7 inch, doz.	\$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

## EAVES TROUGH

Galv. Crimpedge, crated	75-10 %
Zinc, "Barnes"	60 %

## ELBOWS

Conductor Pipe	
Galv. plain or corrugated,	
round flat Crimp.	
28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Galv. Terne Steel	
Plain Rd. and Rd. Corr.	
28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

## Square Corrugated

28 gauge	50 %
26 gauge	35 %

## Portico Elbows

Standard Gauge Conductor Pipe,	
plain or corrugated.	
Not nested	70 & 5 %
Nested solid	70 & 5 %

## Sq. Corr., A. & B. & Octagon

28 gauge	50 %
26 gauge	35 %

## Portico

1, 1 1/4, 1 1/2 inch	45 %
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## Copper

16 oz. all designs	45 %
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## Zinc

All styles	60 %
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## ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue	
"Milcor" No. 28 Gauge.	Doz.
5 inch	\$1.15
6 inch	1.28
7 inch	1.75

## Special Corrugated

6 inch	\$1.00
7 inch	1.60

## Adjustable—Uniform Blue

"Milcor" No. 28 Gauge, Uniform	
Blue.	
5 inch	\$1.60
6 inch	1.75
7 inch	2.10

## WOOD FACES—60 % off list.

## FIRE POTS

Geo. W. Diener Mfg. Co.	Each
No. 02 Gasoline Torch, 1 qt.	\$5.13
No. 9250/ Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace	
Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace	
Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

## GLASS

Single and Double Strength, A,	
all brackets	85 %
Single and Double Strength, B,	
all brackets	87 %

## HANGERS

Conductor Pipe	
Milcor Perfection Wire	25 %
Milcor Triplex Wire	10 %

## Eaves Trough

Milcor Steel (galv. after forming) from list	45 %
Milcor Selflock E. T. Wire,	
List	10 %

## HOOKS

Conductor	
"Direct Drive" Wrought Iron	
for wood or brick	15 %

## MITRES

Galvanized Steel Mitres	
28 gauge	70
26 gauge	60-20

## PASTE

Asbestos Dry Paste	
200-lb. barrel	\$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

## PIPE

Galvanized	
Crated and nested (all gauges)	75-7 1/2 %
Crated and not nested (all gauges)	75-2 1/2 %

## Furnace Pipe

Double Wall Pipe and Fittings	60 %
Single Wall Pipe, Round Galvanized Pipe	60 %
Galvanized and Tin Fittings	60 %

## Lead

Per 100 lbs.	\$12.50
Stove Pipe	
"Milcor" "Titelock" Uniform Blue	
Stove	
28 gauge, 5 inch U. C.	
28 gauge, 6 inch U. C.	\$11.00
28 gauge, 7 inch U. C.	12.00
30 gauge, 5 inch U. C.	14.00
30 gauge, 6 inch U. C.	10.25
30 gauge, 7 inch U. C.	11.00
30 gauge, 7 inch U. C.	13.00

## T-Joint Made Up

6 inch, 28 ga.	per doz. \$3.40
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## REGISTERS AND FACES

Floor Registers	
Except Cast Iron	40 & 10 %
Cast Iron	20 %

## Baseboard

2-Piece	40 & 10 %
1-Piece	40-10 & 20 %

## Adjustable Ventilators

Adjustable Cold Air Faces	40 & 10 %
Adjustable Ventilators	40 & 10 %

## RIDGE ROLL

Galv. Plain Ridge Roll,	
b'd'd	75-15-5 %
Galv., Plain Ridge Roll,	
crated	75-15 %

## SCREWS

Sheet Metal	
7, 1/4 x 1/4, per gross	\$0.52
No. 10, 1/4 x 3/16, per gross	0.68
No. 14, 1/4 x 1/4, per gross	0.83

## SHEARS, TINNERS' AND MACHINISTS'

Viking	\$22.00
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## Lennox Throatless

No. 18	35 %
Shear blades	10 %
(f. o. b. Marshalltown, Iowa.)	

## SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60 %
26 gauge, round flat crimp	45 %
24 gauge, round flat crimp	15 %

## SNIPS, TINNERS'

Milcor	Net
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## VENTILATORS

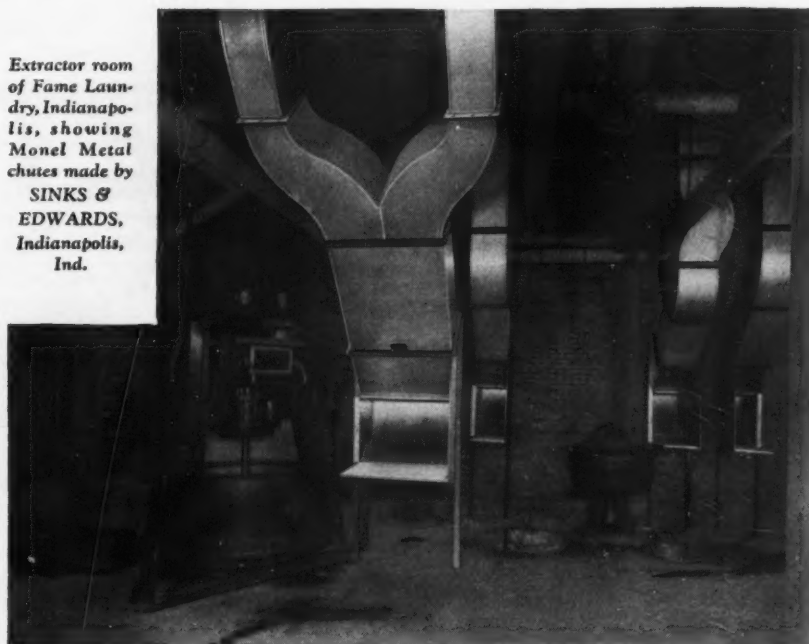
Standard	30 to 40 %
Milcor	Net

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J. M. & L. A. Osborn Co., Cleveland, Ohio
- Blast Gates**  
Berger Bros. Co., Philadelphia, Pa.
- Blowers—Furnace**  
American Machine Products Co., Marshalltown, Iowa  
Brundage Co., Kalamazoo, Mich.  
Lakeside Co., Hermansville, Mich.  
Warm Air Furnace Fan Co., Cleveland, Ohio
- Bolts—Stove**  
Lamson & Sessions Co., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
- Brakes—Bending**  
Dreis & Krump Mfg. Co., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
- Brakes—Cornices**  
Dreis & Krump Mfg. Co., Chicago, Ill.
- Brass and Copper**  
American Brass Co., Waterbury, Conn.  
Chase Brass & Copper Co., Waterbury, Conn.  
Copper & Brass Research Association, New York, N. Y.  
Revere Copper & Brass, Rome, N. Y.
- Bronze**  
Revere Copper & Brass, Rome, N. Y.
- Cans—Garbage**  
Diener Mfg. Co., G. W., Chicago, Ill.  
Osborn Co., The J. M. & L. A., Cleveland, Ohio
- Castings—Malleable**  
Fanner Mfg. Co., Cleveland, Ohio
- Ceilings—Metal**  
Eller Manufacturing Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Chaplets**  
Fanner Mfg. Co., Cleveland, Ohio
- Cleaners—Vacuum**  
Brillion Furnace Co., Brillion, Wis.  
National Super Service Co., Toledo, Ohio
- Copper**  
American Brass Co., Waterbury, Conn.  
Chase Brass & Copper Co., Waterbury, Conn.  
Revere Copper & Brass, Rome, N. Y.  
Rockford Sheet Steel Co., Rockford, Ill.
- Cornices**  
Eller Manufacturing Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Cut-offs—Rain Water**  
Eller Manufacturing Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Dampers—Quadrants—Accessories**  
Eller Mfg. Co., Canton, Ohio  
Hart & Cooley Co., Holland, Mich.  
Howes Co., S. M., Boston, Mass.  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City  
Parker-Kalon Corp., New York, N. Y.
- Dampproofings**  
Lastik Products Corp., Pittsburgh, Pa.
- Damper Regulators**  
Sheer Co., H. M., Quincy, Ill.
- Diffuser—Air Duct**  
Aeolus-Dickinson Co., Chicago, Ill.
- Drills—Electric**  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
J. M. & L. A. Osborn Co., Cleveland, Ohio
- Drive Screws—Hardened Metallic**  
Parker-Kalon Corp., 200 Varick St., New York
- Dust Eliminator**  
Dustless Ash Co., Muskegon, Mich.
- Eaves Trough**  
Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Chase Brass & Copper Co., Waterbury, Conn.  
Eller Mfg. Co., Canton, Ohio  
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Rockford Sheet Steel Co., Rockford, Ill.
- Elbow and Shoes—Conductor**  
Barnes Metal Products Co., Chicago, Ill.  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City  
Rockford Sheet Steel Co., Rockford, Ill.
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Barnes Metal Products Co., Chicago, Ill.  
Braden Mfg. Co., Terre Haute, Ind.  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Flue Thimbles**  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Fluxes—Soldering**  
Kester Soldering Co., Chicago, Ill.
- Furnace Cement**  
Connors Paint Mfg. Co., Wm., Troy, N. Y.  
Eller Mfg. Co., Canton, Ohio  
Lastik Products Corp., Pittsburgh, Pa.  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Furnace Cement—Liquid**  
Technical Products Co., Pittsburgh, Pa.
- Furnace Chain**  
Hart & Cooley Co., Holland, Mich.
- Furnace Cleaners—Suction**  
Brillion Furnace Co., Brillion, Wis.  
National Super Service Co., Toledo, Ohio
- Furnace Fans**  
Brundage Co., The Kalamazoo, Mich.  
Lakeside Co., Hermansville, Mich.  
Robinson Co., A. H., Massillon, Ohio  
Warm Air Furnace Fan Co., Cleveland, Ohio
- Furnace Paste**  
Larsen-Bennett Co., Omaha, Neb.
- Furnace Pokers**  
Fanner Mfg. Co., Cleveland, Ohio
- Furnace Pulleys**  
Hart & Cooley Co., Holland, Mich.
- Furnace Regulators**  
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
Sheer Co., H. M., Quincy, Ill.  
White Mfg. Co., Minneapolis, Minn.
- Furnace Rings**  
Eller Mfg. Co., Canton, Ohio  
Forest City-Walworth Run Foundries Co., Cleveland, Ohio  
Milwaukee Corrugating Co., Milwaukee, Wis.
- Furnace Switch—Automatic**  
Payne Furnace & Supply Co., Beverly Hills, Cal.  
Robinson Co., A. H., Massillon, Ohio
- Furnaces—Gas**  
Calkins & Pearce, Columbus, Ohio  
Payne Furnace & Supply Co., Beverly Hills, Cal.  
Robinson Co., A. H., Massillon, Ohio  
Rudy Furnace Co., Dowagiac, Mich.  
Wise Furnace Co., Akron, Ohio
- Furnaces—Warm Air**  
Agricola Furnace Co., Gadsden, Ala.  
American Furnace Co., St. Louis, Mo.  
Brillion Furnace Co., Brillion, Wis.  
Farris Furnace Co., Springfield, Ill.  
Forest City-Walworth Run Fdy., Cleveland, Ohio  
Fox Furnace Co., Elyria, Ohio  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Hess Warming & Ventilating Co., Chicago, Ill.  
Langenberg Mfg. Co., St. Louis, Mo.  
London Furnace Co., London, Ohio  
Lennox Furnace Co., Marshalltown, Iowa  
May Flebeger Furnace Co., Newark, Ohio  
Meyer Furnace Co., The, Peoria, Ill.  
Midland Furnace Co., Columbus, Ohio  
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
Payne Furnace & Supply Co., Beverly Hills, Cal.  
Premier Warm Air Heater Co., Dowagiac, Mich.  
Peerless Foundry Co., Indianapolis, Ind.  
Richardson & Boynton Co., New York, N. Y.  
Robinson Co., A. H., Massillon, Ohio  
Rudy Furnace Co., Dowagiac, Mich.  
Standard Fdy. & Furnace Co., De Kalb, Ill.  
Success Heater Mfg. Co., Des Moines, Iowa  
Schwab & Sons Co., R. J., Milwaukee, Wis.  
Waterman-Waterbury Co., Minneapolis, Minn.  
Western Steel Products Co., Duluth, Minn.  
Wise Furnace Co., Akron, Ohio
- Gas Burning Attachments**  
Munkel-Rippel Heating Co., Columbus, Ohio
- Grilles**  
Auer Register Co., Cleveland, Ohio  
Harrington & King Perforating Co., Chicago, Ill.  
Hart & Cooley Co., New Britain, Conn.  
Independent Register & Mfg. Co., Cleveland, Ohio
- Guards—Machine and Belt**  
Harrington & King Perforating Co., Chicago, Ill.
- Handles—Boiler**  
Berger Bros. Co., Philadelphia, Pa.
- Handles—Soldering Iron**  
Hyro Mfg. Co., New York, N. Y.
- Handles—Furnace Door**  
Fanner Mfg. Co., Cleveland, Ohio
- Hangers—Eaves Trough**  
Berger Bros. Co., Philadelphia, Pa.  
Chase Brass & Copper Co., Waterbury, Conn.  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Heat Regulation Systems**  
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
Sheer Co., H. M., Quincy, Ill.  
White Mfg. Co., Minneapolis, Minn.
- Heaters—Cabinet**  
Fox Furnace Co., Elyria, Ohio  
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.  
Waterman-Waterbury Co., Minneapolis, Minn.
- Heaters—Combination Water**  
Alamo Heater Co., Chicago, Ill.  
Standard Fdy. & Furnace Co., De Kalb, Ill.
- Heaters—Domestic Hot Water**  
Alamo Heater Co., Chicago, Ill.  
Standard Fdy. & Furnace Co., De Kalb, Ill.
- Heaters—School Room**  
Meyer Furnace Co., The, Peoria, Ill.  
Western Steel Products Co., Duluth, Minn.  
Waterman-Waterbury Co., Minneapolis, Minn.
- Humidifiers**  
Diener Mfg. Co., G. W., Chicago, Ill.  
Meyer & Bro. Co., F., Peoria, Ill.  
Sheer Co., H. M., Quincy, Ill.
- Lath—Expanding Metal**  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Machines—Crimping**  
Bertsch & Co., Cambridge City, Ind.
- Machinery—Culvert**  
Bertsch & Co., Cambridge City, Ind.
- Machines—Tinsmith's**  
Bertsch & Co., Cambridge City, Ind.  
Dreis & Krump Mfg. Co., Chicago, Ill.  
Hyro Mfg. Co., New York, N. Y.  
Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co., Marshalltown, Iowa  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
Whitney Mfg. Co., W. A., Rockford, Ill.
- Metals—Perforated**  
Harrington & King Perforating Co., Chicago, Ill.
- Miters**  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Miters—Eaves Trough**  
Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Braden Mfg. Co., Terre Haute, Ind.  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
- Nails—Copper and Brass**  
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Revere Copper & Brass, Rome, N. Y.

(Continued on page 54)

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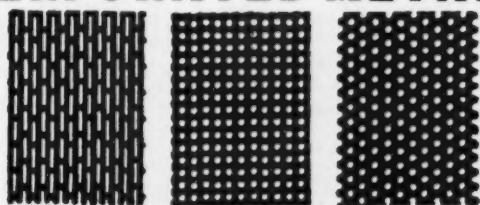
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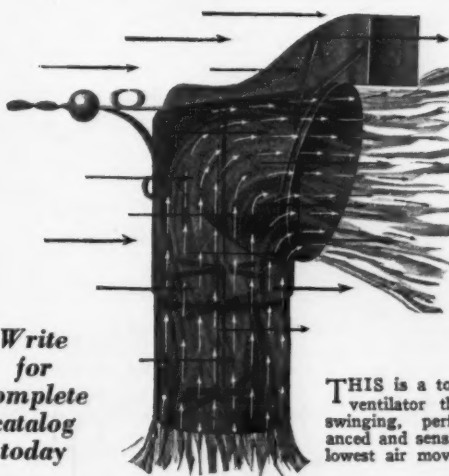


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(Continued from page 52)

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**Oil Burners**Crystal Oil Burner Corp., New York, N. Y.  
McIlvaine Burner Corp., Evanston, Ill.**Ornaments—Sheet Metal**Eller Mfg. Co., Canton, Ohio  
Miller & Doing, Inc., Brooklyn, N. Y.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Paint**Connors Paint Mfg. Co., Wm.,  
Troy, N. Y.**Perforated Metals**Harrington & King Perforating Co.,  
Chicago, Ill.**Pipe and Fittings—Furnace**Eller Mfg. Co., Canton, Ohio  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Meyer & Bro. Co., F., Peoria, Ill.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio  
Peerless Foundry Co.,  
Indianapolis, Ind.**Pipe and Fittings—Stove**Meyer & Bro. Co., F., Peoria, Ill.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Pipe—Conductor**Barnes Metal Products Co.,  
Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Punches**Bertsch & Co., Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
W. A. Whitney Mfg. Co., Rockford, Ill.**Punches—Combination Bench and Hand**

Hyro Mfg. Co., New York, N. Y.

**Punches—Hand**Hyro Mfg. Co., New York, N. Y.  
W. A. Whitney Mfg. Co., Rockford, Ill.**Putty—Stove**Connors Paint Mfg. Co., Wm.,  
Troy, N. Y.**Radiator Cabinets**

Hart &amp; Cooley Co., Holland, Mich.

**Ranges—Gas**Mt. Vernon Furnace & Mfg. Co.,  
Mt. Vernon, Ill.  
Richardson & Boynton Co.,  
New York, N. Y.**Registers—Warm Air**Auer Register Co., Cleveland, Ohio  
Eller Mfg. Co., Canton, Ohio  
Forest City-Walworth Run Foundries  
Co., Cleveland, Ohio  
Hart & Cooley Co., Holland, Mich.  
Henry Furnace & Fdy. Co.,  
Cleveland, Ohio  
Independent Register & Mfg. Co.,  
Cleveland, Ohio  
Meyer & Bro. Co., F., Peoria, Ill.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Rock Island Register Co.,  
Rock Island, Ill.  
Symonds Register Co., St. Louis, Mo.**Registers—Wood**American Wood Register Co.,  
Plymouth, Ind.  
Auer Register Co., Cleveland, Ohio  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Regulators—Heat**Minneapolis-Honeywell Regulator  
Co., Minneapolis, Minn.  
H. M. Sheer Co., Chicago, Ill.  
White Mfg. Co., Minneapolis, Minn.**Ridging**American Rolling Mill Co.,  
Middletown, Ohio  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Rivets—Stove**Lamson & Sessions Co., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.**Rods—Stove**

Lamson &amp; Sessions Co., Cleveland, Ohio

**Rolls—Forming**

Bertsch &amp; Co., Cambridge City, Ind.

**Roofing Cement**Connors Paint Mfg. Co., Wm.,  
Troy, N. Y.  
Lastik Products Corp., Pittsburgh, Pa.**Roof Paints**

Lastik Products Corp., Pittsburgh, Pa.

**Roof—Flashing**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Milwaukee, Wis.**Roofing—Iron and Steel**American Rolling Mill Co.,  
Middletown, Ohio  
Central Alloy Division, Republic  
Steel Corp., Youngstown, Ohio  
Eller Mfg. Co., Canton, Ohio  
Inland Steel Co., Chicago, Ill.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.**Roofing—Tin**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Taylor Co., N. & G., Philadelphia, Pa.**Rubbish Burners**

Hart &amp; Cooley Co., New Britain, Conn.

**Schools—Sheet Metal Pattern Drafting**St. Louis Technical Institute,  
St. Louis, Mo.**Schools—Warm Air Heating**St. Louis Technical Institute,  
St. Louis, Mo.**Screws—Hardened Metallic Drive**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Parker-Kalon Corp.,  
200 Varick St., New York**Screws—Hardened Self-Tapping, Sheet Metal**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Parker-Kalon Corp.,  
200 Varick St., New York**Screens—Perforated Metal**Harrington & King Perforating Co.,  
Chicago, Ill.**Shears—Hand and Power**Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co.,  
Marshalltown, Ia.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
Viking Shear Co., Erie, Pa.**Sheet Metal Screws—Hardened, Self-Tapping**Parker-Kalon Corp.,  
200 Varick St., New York**Sheets—Alloy**Central Alloy Division, Republic  
Steel Corp., Youngstown, Ohio  
International Nickel Co.,  
New York, N. Y.**Sheets—Black and Galvanized**American Rolling Mill Co.,  
Middletown, Ohio  
Central Alloy Division, Republic  
Steel Corp., Youngstown, Ohio  
Eller Mfg. Co., Canton, Ohio  
Inland Steel Co., Chicago, Ill.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
National Association of Flat Rolled  
Steel Manufacturers, Cleveland, Ohio  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio  
Rockford Sheet Steel Co.,  
Rockford, Ill.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
Taylor Co., N. & G., Philadelphia, Pa.**Sheets—Iron**American Rolling Mill Co.,  
Middletown, Ohio  
Central Alloy Division, Republic  
Steel Corp., Youngstown, Ohio  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.**Sheets—Tin**

Taylor Co., N. &amp; G., Philadelphia, Pa.

**Shingles and Tiles—Metal**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Sifters—Ash**

Diener Mfg. Co., G. W., Chicago, Ill.

**Sky Lights**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Snips**Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.**Solder—Acid Core**

Kester Solder Co., Chicago, Ill.

**Solder—Self-Fluxing**

Kester Solder Co., Chicago, Ill.

**Solder—Rosin Core**

Kester Solder Co., Chicago, Ill.

**Solder**Eller Mfg. Co., Canton, Ohio  
Kester Solder Co., Chicago, Ill.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Soldering Coppers**

Revere Copper &amp; Brass, Rome, N. Y.

**Soldering Furnaces**Diener Mfg. Co., G. W., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.**Specialties—Hardware**

Diener Mfg. Co., G. W., Chicago, Ill.

**Stars—Hard Iron Cleaning**

Fanner Mfg. Co., Cleveland, Ohio

**Statuary**

Miller &amp; Doing, Inc., Brooklyn, N. Y.

**Stove Pipe Reducers**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Tinplate**Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio  
Taylor Co., N. & G., Philadelphia, Pa.**Tools—Tinsmith's**Bertsch & Co., Cambridge City, Ind.  
Dries & Krump Mfg. Co., Chicago, Ill.  
Hyro Mfg. Co., New York, N. Y.  
Interstate Machinery Co., Chicago, Ill.  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio  
Rockford Sheet Steel Co.,  
Rockford, Ill.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.  
Viking Shear Co., Erie, Pa.  
Whitney Mfg. Co., W. A.,  
Rockford, Ill.**Torches**Diener Mfg. Co., G. W., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T.,  
Chgo., N. Y., St. L., Det., Cleve.**Trade Extension**Copper & Brass Research Association  
National Association of Flat Rolled  
Steel Manufacturers, Cleveland, Ohio  
Sheet Steel Trade Extension  
Committee, Cleveland, Ohio**Trimnings—Stove and Furnace**

Fanner Mfg. Co., Cleveland, Ohio

**Vacuum Cleaner—Furnace**Brillion Furnace Co., Brillion, Wis.  
National Super Service Co.,  
Toledo, Ohio**Ventilators**Aeolus Dickinson Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Eller Mfg. Co., Canton, Ohio  
Paul R. Jordan & Co., Indianapolis, Ind.  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City**Ventilators—Ceiling**Hart & Cooley Co., New Britain, Conn.  
Henry Furnace & Fdy. Co.,  
Cleveland, Ohio**Wood Faces—Warm Air**Auer Register Co., Cleveland, Ohio  
American Wood Register Co.,  
Plymouth, Ind.  
Eller Mfg. Co., Canton, Ohio  
Milwaukee Corrugating Co.,  
Mil., Chgo., La Crosse, Kan. City

Say you saw it in AMERICAN ARTISAN—Thank you!





The "Torrid" Furnace is designed to give a tremendous amount of heat, much more than that furnished by the ordinary tinner's furnace.

A fuel saver and generating machine of the finest quality made at the price.

**GEO. W. DIENER MFG. CO.**

404 North Monticello Ave.

Chicago

## Sheet Metal Pattern Problems solved by experts---

In this issue and every issue of AMERICAN ARTISAN you will find one or two sheet metal patterns with full details as to how to develop them. Send in *your* problems for free solution. Save the pattern pages of each issue so your men can refer to them.

## Progressive Sheet Metal and Warm Air Heating Contractors use Window Displays---

Let the other fellow see what a fine window display and store front you have. Send us a picture of your window display and tell us how it pulls extra business your way.

## What form of advertising brings best results for your business---

Some dealers find newspaper advertising best and others use direct by mail with consistent good results. Some men find that large billboards or electric signs do the advertising job the best.

Send clippings of your newspaper advertising and samples of your direct by mail advertising to AMERICAN ARTISAN and tell us what results this advertising brought you.

If you use a large sign or billboards send us a photograph so we can show how you advertise your business.

★ Save this for reference in ordering extra punches and dies for—

## WHITNEY *Lever* PUNCHES.



This type of extra punches and dies used in

Punches Nos.

1

2

4

No. 6 Skylight

8

and

Channel Iron,

also Nos.

5

7

and

Imperial No. 8



This type of extra punches and dies used in

Punches

Nos.

10

11

12

14

15

20

24

25

40

and

40A



For Dependable Quality Punches and Dies Mail Your Order to Us and Get What You Want—When You Want It.

Ask Your  
Jobber  
for



Tools and  
Punches

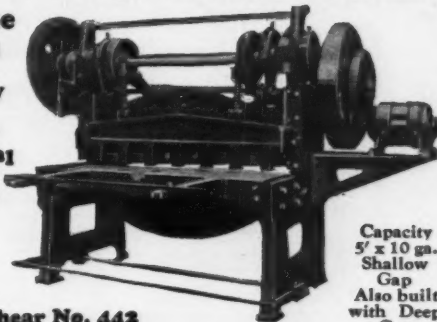
**W. A. WHITNEY MFG. CO.**

636 Race Street

Rockford, Ill.

## BERTSCH SQUARING SHEAR

Our Line  
Light and  
Heavy  
Machinery  
for all  
classes of  
Sheet Metal,  
Plate and  
Structural  
Work



Squaring Shear No. 442

**BERTSCH & CO., Cambridge City, Ind.**

Capacity  
5' x 10 ga.  
Shallow  
Gap  
Also built  
with Deep  
Gap

## CHICAGO STEEL SLITTING SHEAR

**LIGHT—POWERFUL  
DURABLE**



Capacity 10 gauge sheets  
Any Length or Width  
Flat Bars 3/16x2"  
Weight 22 pounds

**Price \$15.00 Net**

F. O. B. Chicago

Made of pressed steel and equipped with hold-down. Blades of highest grade crucible steel. Most indispensable high grade shears made. Equal to other shears selling at over twice the price. **ORDER YOURS TODAY.**

**DREIS & KRUMP MFG. CO., 7404 Loomis St., Chicago**

Mention AMERICAN ARTISAN in your reply—Thank you!

# Alphabetical List of Advertisers

*Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.*

A-C Mfg. Co.*.....	.....	Langenberg Mfg. Co.*.....	.....
Aeolus-Dickinson Co.*.....	.....	Larsen-Bennett Co. ....	12
Agricola Furnace Co.*.....	.....	Lastik Products Co.*.....	.....
Alamo Heater Co.....	12	Lennox Furnace Co.....	9
American Brass Co.*.....	.....	London Furnace Co.*.....	.....
American Fdy. & Furn. Co.*.....	.....	Marshall Furnace Co.*.....	.....
American Furnace Co.....	15	Marshalltown Mfg. Co.*.....	.....
American Machine Products Co.....	11	May-Fiebeger Co. ....	8
American Rolling Mill Co.*.....	.....	McIlvaine Burner Corp.....	12
American Wood Register Co.....	12	Meyer & Bro. Co., F.....	10
Auer Register Co.*.....	.....	Meyer Furnace Co.*.....	.....
Barnes Metal Prod. Co.*.....	.....	Midland Furnace Co.*.....	.....
Beckwith Co. ....	11	Miller & Doing, Inc.....	53
Berger Bros. Co.....	53	Milwaukee Corrugating Co.....	Back Cover
Bertsch & Co.....	55	Minneapolis-Honeywell Reg. Co.*.....	.....
Braden Mfg. Co.....	59	Munkel-Rippel Heating Co.....	9
Brillion Furnace Co.....	9	Mt. Vernon Furnace & Mfg. Co.*.....	.....
Brundage Co.*.....	.....	National Assn. of Flat Rolled Steel Mnfrs.*.....	.....
Calkins & Pearce.....	9	National Super Service Co.....	11
Central Alloy Division Republic Steel Corp.*.....	.....	Osborn Co., The J. M. & L. A.....	53
Chase Brass & Copper Co.*.....	.....	Parker-Kalon Corp. ....	49
Connors Paint Co., Wm.....	13	Payne Furnace & Supply Co.*.....	.....
Copper and Brass Research Assn.*.....	.....	Peck, H. E.....	58
Crystal Oil Burner Co.*.....	.....	Peerless Foundry Co.*.....	.....
Deniston Co.*.....	.....	Premier Warm Air Heater Co.*.....	.....
Diener Mfg. Co., Geo. W.....	55	Republic Steel Corp.*.....	.....
Dreis & Krump Mfg. Co.....	55	Revere Copper & Brass, Inc.*.....	.....
Dustless Ash Co.....	12	Richardson & Boynton Co.*.....	.....
Eller Mfg. Co.*.....	.....	Robinson Co., A. H.*.....	.....
Emrich Co., C.*.....	.....	Rock Island Register Co.*.....	.....
Fanner Mfg. Co.....	12	Rockford Sheet Steel Co.*.....	.....
Farris Furnace Co.....	8	Rudy Furnace Co.*.....	.....
Forest City-Walworth Run Foundries Co.*.....	.....	Ryerson & Son, Inc.....	53
Fort Shelby Hotel*.....	.....	Sall Mountain Co.*.....	.....
Fox Furnace Co.*.....	.....	Schwab & Sons Co., R. J.....	11
Harrington & King Perf. Co.....	53	Sheer Co., H. M.....	12
Hart & Cooley Co.....	13	Standard Fdy. & Furn. Co.*.....	.....
Henry Furn. & Fdy. Co.....	3	St. Louis Tech. Inst.....	58
Hess Warming & Ventilating Co.....	16	Success Heater Mfg. Co.....	2
Howes Co., S. M.....	13	Symonds Register Co.*.....	.....
Hyro Mfg. Co.*.....	.....	Taylor Co., N. & G.*.....	.....
Independent Reg. & Mfg. Co.....	12	Technical Products Co.....	58
Inland Steel Co.*.....	.....	Viking Shear Co.....	58
International Nickel Co.....	51	Warm Air Furnace Fan Co.....	4 and 5
Interstate Machinery Co.....	58	Waterman-Waterbury Co. ....	7
Jordan & Co., Paul R.....	53	Watt Mfg. Co.*.....	.....
Kester Solder Co.*.....	.....	Western Steel Products Co.....	6
Lakeside Co. ....	13	White Mfg. Co.*.....	.....
Lamneck & Co., W. E.*.....	.....	Whitney Mfg. Co., W. A.....	55
Lamson & Sessions Co., The.....	13	Wise Furnace Co.*.....	.....

**THE BUYERS' DIRECTORY APPEARS ON PAGES 52 AND 54**



## WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired, and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

## BUSINESS CHANCES

**Lightning Rods**—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddle Company, Marshfield, Wis.

**Partner Wanted**—I am looking for a good, honest man who is willing to work with me, pull together and help me make money in the sheet metal and furnace business. The hardware people with whom I am now associated are willing to sell out but I haven't enough capital. Would require about \$2,000.00. It means an investment of \$2,000 for half interest I am a hard worker, and partner must be willing to work as I do, taking the same privileges. Address S-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**For Sale**—Business and home, Illinois city of 100,000. Good chance for hustler. Corner lot 50x150, alley in rear. 5 room house. Business bldg. 22x52. Two stores, upper has shop, full set tinner's tools and tin stock. Lower floor hardware store and stock and garage. Selling on account of age. \$7000.00—excellent terms. Address S522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**For Sale**—Plumbing and tin shop in central Alberta. Building on main street 25x30 ft., two story, with 6 living rooms above. Sewer just installed in town. Will take \$2000.00 cash for building and tools. This is a snap for a man looking for a good opening. Address C. E. Hannay, P. O. Box 461, Stettler, Alberta, Canada. R522

**Sheet metal, jobbing and manufacturing shop for sale.** In successful operation for 20 years. Ninety miles south of Chicago. Lot, building, stock and tools well worth \$2,500. Selling on account of age and ill health. Will take less for immediate sale. Address H. W. Darrow, Winamac, Ind. J-521

**Will sell very reasonably, tin and plumbing shop and warm air heating in one of the best towns in southwestern Minnesota.** Doing a nice business but ill health forces me to sell. Address M522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**For Sale**—Well equipped plumbing, heating and sheet metal shop. Only shop in town of 1600 population. Centrally located. Six good size living rooms in connection. Good chance for a hustler. Address P522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Wanted to Buy**—Small sheet metal shop in Kansas or Oklahoma, or go in as working partner. Can furnish best of references. Address R-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

## BUSINESS CHANCES

**For Sale**—Tin shop, roofing and furnace business. Good trade, located on west side of Chicago. Fully equipped. Offer very reasonable. Selling on account of age. Address O522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

## SITUATION WANTED

**Position Wanted**—An experienced heating man competent to take complete charge of your warm air heating department handling sales, collections as well as superintending installations, seeks an opportunity where compensation depends on ability and success. Age 35, married with family. Honest, a hard worker, a successful record of accomplishments, can produce A-1 references. Now employed in Central Illinois and willing to move wherever a real opportunity exists. Address A-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Sheet metal mechanic, 21 years' experience** in ventilating, skylight, cornice, furnace, restaurant and general sheet metal work, desires position. Capable of taking any sized job and completing same according to specifications. Experienced foreman and estimator. Can furnish reference from all former employers. Married, sober, reliable and anxious to connect with firm where there is a future. Employed but wish to make change. Address X-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By superintendent who understands estimating, costs, production, designing, engineering and marketing in the various branches of the metal industry, comprising metal specialties, metal stamping, tanks, structural steel, heating and ventilating, etc. Twenty years' experience with one firm in executive capacity; 44 years of age and married. Address C-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Some Furnace Manufacturer of prominence is looking for a young man of 26 interested in the betterment of the industry.** I am a high school graduate with 8 years of experience in the Sheet Metal and Furnace work, something with a future. Not afraid of work. Best of references and will go anywhere. Address L522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation wanted by combination man, plumber and sheet metal worker experienced in plumbing, installing and jobbing, also furnaces and oil burners.** Wish to connect with hardware store with shop in small town. Young, married, reliable and employed but want to make a change. Year around job. Address H522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Position wanted by experienced furnace and specialty salesman who personally knows and has sold most of the largest furnace dealers and jobbers in Iowa.** Young married man 30 years of age and own my own home. Centrally located in Iowa. Can furnish best of references. Address J522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—Furnace man and sheet metal worker. Can estimate, layout and sell jobs. Have had some plumbing, hot water and steam experience. Have worked at the trade twenty-five years. Married and strictly sober. Can come at once. Address Y-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By all around sheet metal worker. Can handle any branch of the trade such as cornice, skylight, ventilation and hot air heating. Can also make estimates and take care of shop. Middle aged, sober and steady. Will go anywhere. Address C-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By all around sheet metal worker and furnace man. Want a year around job. Will connect with shop where owner wants to sell out or retire next year. Habits and health o.k. Midwestern states preferred. Address Z-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Position Wanted**—By young man experienced in ventilation, furnace and general sheet metal work. Good layout man and draftsman. Steady work more essential than high wages. Address Carl Slater, 2214 7½ St. So., Minneapolis, Minn. B-521

## SITUATION WANTED

**Situation wanted by all around tinner, furnace heating a specialty.** Experienced at plumbing and hardware store work. Would accept position anywhere west of Chicago. Please state kind of work you have and salary paid for permanent situation. Address W522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By experienced sheet metal salesman. Twenty-three years' traveling experience in the line. Well acquainted with sheet metal and furnace dealers in Iowa. Reference and bond furnished Iowa territory. Can begin work at once. Address Z-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—Thoroughly reliable experienced heating man and salesman for furnaces, fittings and good installations. 20 years' experience in the furnace heating game. Clean record, references and car. Illinois or Ohio preferred. Address E-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Position Wanted**—By all-round sheet metal worker. Have had experience in all lines of work, either at bench or outside. Can estimate draft patterns and take charge of anything in the business. Illinois or Indiana preferred. Address A-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By combination sheet metal, plumbing and heating man. Will take straight plumbing or sheet metal job. Very good on warm air heating. Forty years of age, 18 years at the trade and will go anywhere. Address T-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Position wanted by experienced sheet metal worker on in and outside work, furnace work and general jobbing.** Please state wages and working conditions. Address G522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation wanted by all around man with 28 years' of experience in tinning, plumbing, steel ceilings and all kinds of heating, etc.** Wish position in Wisconsin. Address K522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By first class sheet metal worker, plumber and warm air furnace man. Would like position in connection with hardware store. Iowa or Illinois preferred. Address S-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By experienced tinner and warm air furnace installer. Good on gutters and all outside work. Sober and steady workman. Years of experience in hardware and tin shop. Address Y-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By good reliable sheet metal man. Experienced in warm air heating; 18 years at the business and would like to locate in one-man shop in small town. Address H. E. Laurence, 3703 Meldrum, Detroit, Mich. P-520

**Position Wanted**—Heating, ventilating, blow-piping or mill work. Twenty-two years at the trade. Best of reference on sheet metal work. Address B-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Situation Wanted**—By all around sheet metal worker. Can handle any branch of the trade such as cornice, skylights, ventilation and hot air heating. Address T. W. Babb, 112 East Fourteenth St., Wichita, Kansas. D-522

**Situation Wanted**—By experienced young single man in hardware or grocery store. Can do bookkeeping. Address W-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

## HELP WANTED

**Wanted**—First class sheet metal worker for copper marquis work, also one ventilating man. One dollar per hour. Give full particulars as to experience. Address T522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

**Wanted**—Layout man and sheet metal workers with hollow metal door and trim experience. Address E-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.



## TOOLS AND MACHINES

For Sale—1 No. 737 Pexto Notching Machine complete with stand. 1 No. 653 Pexto 21" Double Seaming Machine with stand. The above in excellent condition, very slightly used. Like new. Write for prices. Address T-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale or Trade—One Chicago Elbow Machine complete with motor. Practically new. Capacity 5" to 36". 24 gauge or lighter. Makes an elbow in two minutes. Write for complete information to The Munkel-Rippel Heating Co., 569 N. 4th St., Columbus, Ohio. F-522

Wanted—To buy the following used machinery: 1—four, five or six foot  $\frac{1}{4}$  in. or  $\frac{1}{2}$  in. capacity brake and 1—four, five or six foot  $\frac{1}{4}$  in. or  $\frac{1}{2}$  in. capacity rolls (power preferred). Address Baker Furnace Co., 2505 Albion St., Toledo, Ohio. G-521

For Sale—One power adjustable machine for making galvanized rolled roofing and valley tin. In good condition and price is right. Address W-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—One set of bench machines and stands, also stakes of all kinds. Fair to good condition. Will make very low price on one or all. Address J. R. Hopkins, 820 E. 12th St., Pueblo, Colo. H-521

For Sale—Hardware fixtures and tools. Only hardware in town of 700. Address R. H. Lowe, Mt. Vernon, Iowa. F-521

Wanted to Buy—30" bar folder and 30" squaring shears. Address Kerstens Tin Shop, 1511 North 8th St., Sheboygan, Wis. X-521

## BOOKS

The Revised Edition of the New Metal Worker Pattern Book by Kittridge and Associates is one book that should be in every shop. As a reference book alone it is indispensable. Over 500 9x11-inch pages with 895 illustrations. It covers the principles underlying practically every problem that is likely to come up in daily practice. Beginning with the selection and use of drawing tools, the author explains linear and geometrical drawing so clearly that one who has had no previous knowledge of arithmetic or drawing may understand these essentials and apply them. The most approved methods of pattern cutting are also given in the course of the work. Price, \$6.00, postpaid. Order from the Book Dept., AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Skylight and Roof Tables—Very handy, giving complete set of tables showing the actual length of common jack and hip bars for all ordinary pitches of skylight, graduated by inches and covering every possible size from 2 feet to 30 feet in width and pitches of from  $\frac{1}{4}$  inch to 24 inches in one foot. A big time-saver. 84 pages; bond paper; handy pocket size. Cloth bound. Price, \$1.00. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Cloth bound, 400 pages each volume. Price, \$7.50 per volume, postpaid. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

## MISCELLANEOUS

For Sale—Hot Water Heating system. Installed four years. 4-22 W Arco Boiler, Four American Radiator Co., peerless plan radiators, Thrush System. Six sets of Crane Packless Valves, Basement Expansion Tank, pipe, fittings and pipe covering. All in A-1 condition. Will sell all or any part of it. Address Moser Brothers, Sabetha, Kansas. P-521

## BOOKS

Exhaust and Blow Piping, by Hayes—Exhaust and Blow Piping has had an unusually big demand. A fresh supply is now off the press and is in our hands for immediate delivery. It has an invaluable treatise on the planning, cost, estimation and installation of fan piping in all its branches, giving all necessary guidance in fan work blower and separator construction. 159 pages, 5x8. 51 figures. Cloth. \$2.00. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

The Standard Code Computing Rule, which is adapted from Article III of the 5th Edition of the Standard Code, is being used by warm air heating men all over the country. Here is what the Computing Rule will determine: (1) The warm air pipe and register areas for first, second and third floor rooms. (2) The areas necessary for 70 degrees inside temperature when the outside temperatures are zero, 10, 20 and 30 degrees above or below zero. (3) The areas from the contents, glass, wall, roof and ceiling. The factors as covered in Table "A" are represented in accurate form. (4) The areas for rooms having one, one and one-half and two air changes per hour. (5) The unusual exposure requirements as the 10 per cent for each and west and 15 per cent for northeast, north and northwest rooms. Rule is circular, measuring  $5\frac{1}{2}$  inches in diameter and  $\frac{1}{4}$  inch thick, being made of specially prepared celluloid. Washable and unbreakable.

Vol. 2 deals with every form of Outside and Architectural Sheet Metal Work. A treatise on Drawing, Full Size Detailing and Lettering, Construction of Cornices, Skylights, Molding, Copings, Electrically Illuminated Signs, etc.

## SPECIAL NOTICES

The Rate for Special Notices  
—displayed want ads—

\$3.00 per inch per insertion  
When sending copy, state whether your name or blind number is to be used—also how many insertions are desired.

## PATENTS

HUBERT E. PECK  
Patent Attorney  
Barrister Bldg., WASHINGTON, D. C.

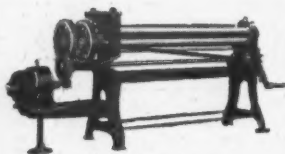
## WANTED

First class sheet metal worker, dependable, steady and sober. No drinker need apply. Need man at once. Address K-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

DEFY oil, fire, gases and acids with COLOR-BESTOS (asbestos in paint form). Used for fire-proofing, cementing pipe threads, furnace insulation, etc.  
TRIAL OFFER:— $\frac{1}{2}$  gal. can, \$2.00 (standard colors)

TECHNICAL PRODUCTS COMPANY  
Mfrs. Insa-Lute Liquid Porcelain  
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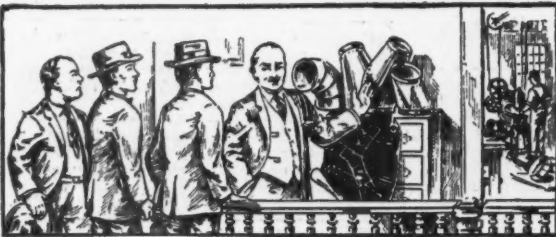
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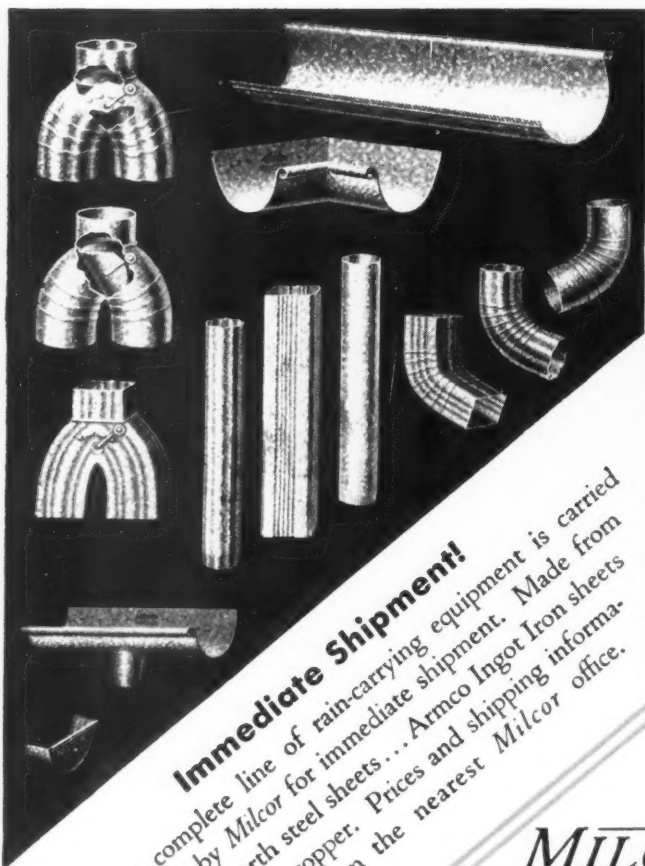
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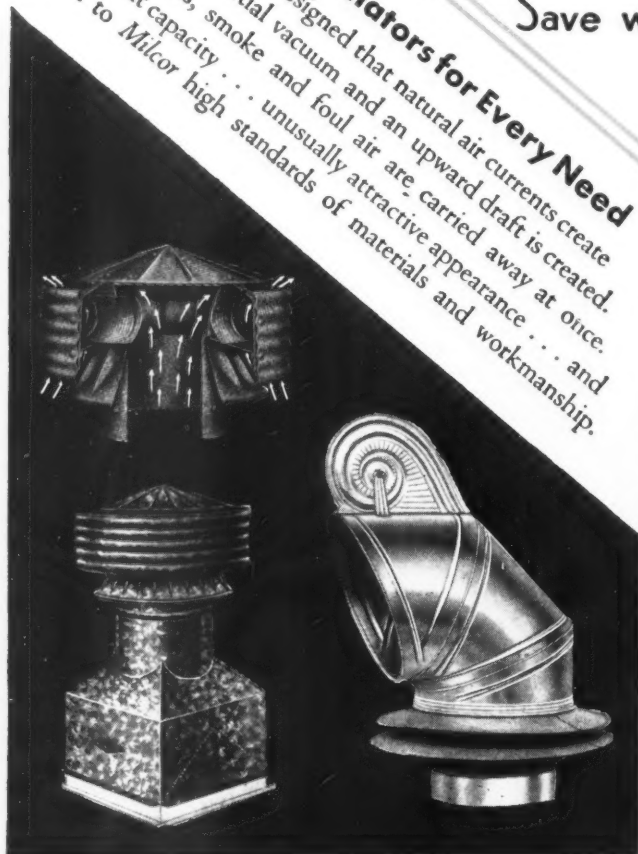
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